PURCHASING / PRODUCTION

CANTON DROP FORGE *HIGH PERFORMANCE CLOSED DIE FORGINGS*

4575 SOUTHWAY ST., S.W. • P.O. BOX 6902 • CANTON, OHIO 44706

PH. 216/477-4511

FAX 216/477-2046

8529 2

THIS ORDER NO. MUST APPEAR ON ALL INVOICES, PACKING SLIPS, B/L AND PACKAGES

PURCHASE ORDER

No 098072

DATE	PAGE
4/25/97	1

2(b)

VENDOR TO:
PARSONS ENGINEERING -PF
19101 VILLAVIEW RD
STE 301
CLEVELAND OH 44119

SHIP TO:
CANTON DROP FORGE
4575 SOUTHWAY STREET S.W.
P.O. BOX 6902
CANTON OH 44706
ATTN: STOCK ROOM

UNLESS OTHERWISE NOTED, SALES TAX DOES NOT APPLY ON ITEMS ORDERED

SHIP VIA:

FREIGHT TERMS:

LINE NO.	ITEM NO.	DESCRIPTION/COMMENTS	U/M	PROMISED DATE	QUANTITY ORDERED	UNIT COST	TOTAL COST
1		WORK AS DEFINED IN APRIL 11, 1997 PROPOSAL (Lagoon #1)					
2							
3		ESTIMATED COST $17,909.00					
4							
5		CONFIRMED TO ED KARKALIK 4/16/97					
6							
7		KJH ESCROW REQ. KH1055					
		Purchase Order Total					.00

5/12/97- 696664- 5/6/97= 1244.36 assessment (thru 4/25/97)
6/26/97- 741150- 6/22/97- 13,321.97 " thru 5/30/97)
8/1/97- 755148- 7/11/97- 1,499.48 " (thru 6/27)

ALL ORDERS:
1. Terms and Conditions on reverse side are part of this Purchase Order
2. Acceptance -- Unless otherwise stated herein, this order must be accepted by the Seller signing and returning the attached acknowledgment copy to Buyer within 10 days from the date of this order, and it is understood that the commencement of any work or the performance of any services hereunder

STEEL ORDERS:
1. Certified test reports in triplicate are to accompany steel shipments. Discount will be taken from date of receipt of goods or test reports, whichever is later.
2. Do not deviate from established producing practice in fulfilling the requirements of this order.

INVOICE DAY OF SHIPMENT TO:
CANTON DROP FORGE
P.O. BOX 6902
CANTON, OH 44706

combination of alternatives. Consequently, attention will be focused for structural integrity as well as biocell material, which has been appropriately stabilized for structural integrity as well as prevention of contaminant leaching, in the re-construction of Lagoon #1. The foregoing analysis will be confirmed as one of the tasks of our proposal, as outlined below.

CDF001600

PARSONS ENGINEERING SCIENCE, INC.

REMIT PAYMENT TO:
File 91849
Los Angeles, CA 90074-1849
Attn: Accounts Receivables

Street Address:
19101 VILLAVIEW ROAD, SUITE 301
CLEVELAND, OHIO 44119

Tel: (216) 486-9005
Fax: (216) 486-6119

INVOICE

2(b)

OCTOBER 21, 1997

CLIENT REF. :
INVOICE NO. : 00870841
PROJECT NO. : 731397-T1
CLIENT NO. : 71275

TO: CANTON DROP FORGE, INC.
4575 SOUTHWAY STREET
CANTON, OHIO 44706

ATTN: MR. KEITH HOUSEKNECHT

PLEASE REMIT TO:
PARSONS ENGINEERING SCIENCE, INC
FILE 91849
LOS ANGELES, CALIFORNIA 90074-1849

FOR: CANTON DROP FORGE LAGDON #1/BIOCELL
AUTHORIZATION: P.O. #98072
AMOUNT BILLED: $17,057.52

BILLING PERIOD: 8/30/97 THROUGH 9/26/97

	HOURS	CURRENT PERIOD THROUGH 9/26/97
WBS 01000 - ASSESSMENT		
DIRECT LABOR	2.5	$62.04
OH & PROFIT @1.95 X D.L.		$120.98
ODCS WITHOUT HANDLING		$5.46
SUBTOTAL:		$188.48
TOTAL THIS INVOICE:		$188.48

CDF001601

CLIENT REF.:
INVOICE NO.: 00870841
PROJECT NO.: 731397-T1
CLIENT NO..: 71275
FORMAT NAME: SBLRLBR15C

	EMPLOYEE NAME	ADJ. DATE	REGULAR HOURS	O/T HOURS	TOTAL HOURS	BILLING RATE	LABOR BILLING	PREMIUM BILLING
20	SPECIALIST I							
	DANA BOND		.50		.50	28.03	14.01	
	CLASSIFICATION TOTALS		.50		.50		14.01	
85	PRINC ENG/SCIENTIST II							
	ELIZABETH J MCCARTNEY	09/26/97	2.00		2.00	84.50	169.01	
	ALAN J RESNIK		1.50		1.50	80.22	120.33	
	ALAN J RESNIK	09/05/97	1.50-		1.50-	80.22	120.33-	
	CLASSIFICATION TOTALS		2.00		2.00		169.01	
	TOTAL LABOR BILLING		2.50		2.50		183.02	

CLIENT REF.:
INVOICE NO.: 00870841
PROJECT NO.: 731397-T1
CLIENT NO..: 71275
FORMAT NAME: SBLRLBR11C

W/E DATE	EMPLOYEE NAME	EMPLOYEE CLASSIFICATION	ADJ. DATE	RATE	REGULAR HOURS	O/T HOURS	TOTAL HOURS
01000	ASSESSMENT						
9/05/97	ALAN J RESNIK	PRINC ENG/SCIENTIST II		80.22	1.50		1.50
9/12/97	DANA BOND	SPECIALIST I		28.03	.50		.50
9/19/97	ALAN J RESNIK	PRINC ENG/SCIENTIST II	09/05/97	80.22	1.50-		1.50-
10/10/97	ELIZABETH J MCCARTNEY	PRINC ENG/SCIENTIST II	09/26/97	84.50	2.00		2.00
	ITEM TOTALS				2.50		2.50
	TOTAL LABOR HOURS				2.50		2.50

DETAIL OF OTHER DIRECT COSTS
FOR THE PERIOD ENDING 9/26/97
BY WBS/COST CODE

INVOICE NO.: 00870841
PROJECT NO.: 731397-T1
CLIENT NO..: 71275
FORMAT NAME: SBLRFODC03
REF:

REFERENCE NUMBER	DESCRIPTION OF EXPENSES	AMOUNT
01000: ASSESSMENT		
9540	FREIGHT/EXPRESS/POSTAGE	2.16
9550	REPRODUCTION CHARGES	1.10
9560	COMMUNICATIONS	2.20
	ASSESSMENT	5.46
	GRAND TOTAL OTHER DIRECT COSTS	5.46

DETAIL OF OTHER DIRECT COSTS
FOR THE PERIOD ENDING 9/26/97
BY JOB/WBS/COST CODE

CLIENT REF.:
INVOICE NO.: 00870841
PROJECT NO.: 731397-T1
CLIENT NO..: 71275
FORMAT NAME: SBLRODCWIT

REF NO.	EQUIP/ VEND NO.	NAME	INVOICE DATE	DATE WORKED	DESCRIPTION	BATCH NO.	AMOUNT
731397	CANTON DROP FORGE LAGOON #1/BI						
01000	ASSESSMENT						
9543	POSTAGE						
00052				9/26/97	POSTAGE	109	2.16
					ACCOUNT TOTAL		2.16
9551	COPIER CHARGES						
30270				9/26/97	COPIER CHARGES	100	1.10
					ACCOUNT TOTAL		1.10
9561	TELEPHONE CHARGES						
00051				9/12/97	TELEPHONE CHARGES	101	1.13
00051				9/12/97	TELEPHONE CHARGES	85	1.07
					ACCOUNT TOTAL		2.20
					ASSESSMENT		5.46
					JOB 731397 TOTAL		5.46
					TOTAL, OTHER DIRECT COSTS		5.46

PARSONS ENGINEERING SCIENCE, INC.

REMIT PAYMENT TO:
File 91849
Los Angeles, CA 90074-1849
Attn: Accounts Receivables

Street Address:
19101 VILLAVIEW ROAD, SUITE 301
CLEVELAND, OHIO 44119

Tel: (216) 486-9005
Fax: (216) 486-6119

INVOICE

2(6)

SEPTEMBER 17, 1997

CLIENT REF. :
INVOICE NO. : 00838508
PROJECT NO. : 731397-T1
CLIENT NO. : 71275

TO: CANTON DROP FORGE, INC.
4575 SOUTHWAY STREET
CANTON, OHIO 44706

ATTN: MR. KEITH HOUSEKNECHT

PLEASE REMIT TO:
PARSONS ENGINEERING SCIENCE, INC
FILE 91849
LOS ANGELES, CALIFORNIA 90074-1849

FOR: CANTON DROP FORGE LAGDON #1/BIOCELL
AUTHORIZATION: P.O. #98072 & P.O. 098867
AMOUNT AUTHORIZED: $19,108.90
AMOUNT BILLED: $16,869.04

BILLING PERIOD: 7/26/97 THROUGH 8/29/97

	HOURS	CURRENT PERIOD THROUGH 8/29/97
WBS 01000 - ASSESSMENT		
DIRECT LABOR	3.0	$96.54
OH & PROFIT @1.95 X D.L.		$188.25
ODCS WITHOUT HANDLING		$18.48
SUBTOTAL:		$303.27
TOTAL THIS INVOICE:		$303.27

CDF001606

CLIENT REF.:
INVOICE NO.: 00838508
PROJECT NO.: 731397-T1
CLIENT NO..: 71275
FORMAT NAME: SBLRLBR15C

	EMPLOYEE NAME	ADJ. DATE	REGULAR HOURS	O/T HOURS	TOTAL HOURS	BILLING RATE	LABOR BILLING	PREMIUM BILLING
30	SENIOR SPECIALIST I							
	KAREN M FARTHING		1.00		1.00	47.87	47.88	
	CLASSIFICATION TOTALS		1.00		1.00		47.88	
90	PRINC ENG/SCIENTIST I							
	EDWARD J KARKALIK		2.00		2.00	118.46	236.91	
	CLASSIFICATION TOTALS		2.00		2.00		236.91	
	TOTAL LABOR BILLING		3.00		3.00		284.79	

CLIENT REF.:
INVOICE NO.: 00838508
PROJECT NO.: 731397-T1
CLIENT NO..: 71275
FORMAT NAME: SBLRLBR11C

W/E DATE	EMPLOYEE NAME	EMPLOYEE CLASSIFICATION	ADJ. DATE	RATE	REGULAR HOURS	O/T HOURS	TOTAL HOURS
01000	ASSESSMENT						
8/08/97	EDWARD J KARKALIK	PRINC ENG/SCIENTIST I		118.46	2.00		2.00
8/08/97	KAREN M FARTHING	SENIOR SPECIALIST I		47.87	1.00		1.00
	ITEM TOTALS				3.00		3.00
	TOTAL LABOR HOURS				3.00		3.00

DETAIL OF OTHER DIRECT COSTS
FOR THE PERIOD ENDING 8/29/97
BY WBS/COST CODE

INVOICE NO.: 00838508
PROJECT NO.: 731397-T1
CLIENT NO..: 71275
FORMAT NAME: SBLRFODC03
REF:

REFERENCE NUMBER	DESCRIPTION OF EXPENSES	AMOUNT
01000: ASSESSMENT		
9540	FREIGHT/EXPRESS/POSTAGE	.78
9550	REPRODUCTION CHARGES	1.00
9570	CAD/GIS/COMPUTERS	16.70
	ASSESSMENT	18.48
	GRAND TOTAL OTHER DIRECT COSTS	18.48

DETAIL OF OTHER DIRECT COSTS
FOR THE PERIOD ENDING 8/29/97
BY JOB/WBS/COST CODE

CLIENT REF.:
INVOICE NO.: 00838508
PROJECT NO.: 731397-T1
CLIENT NO..: 71275
FORMAT NAME: SBLRODCWTT

REF NO.	EQUIP/ VEND NO.	NAME	INVOICE DATE	DATE WORKED	DESCRIPTION	BATCH NO.	AMOUNT
731397	CANTON DROP FORGE LAGOON #1/BI						
01000	ASSESSMENT						
9543	POSTAGE						
00052				8/15/97	POSTAGE	102	.78
					ACCOUNT TOTAL		.78
9551	COPIER CHARGES						
30270				8/15/97	COPIER CHARGES	96	1.00
					ACCOUNT TOTAL		1.00
9573	MICRO-COMPUTER						
25001				8/22/97	MICRO-COMPUTER - CHARGES	104	16.70
					ACCOUNT TOTAL		16.70
					ASSESSMENT		18.48
					JOB 731397 TOTAL		18.48
					TOTAL, OTHER DIRECT COSTS		18.48

PARSONS ENGINEERING SCIENCE, INC.

REMIT PAYMENT TO:
File 91849
Los Angeles, CA 90074-1849
Attn: Accounts Receivables

Street Address:
19101 VILLAVIEW ROAD, SUITE 301
CLEVELAND, OHIO 44119

Tel: (216) 486-9005
Fax: (216) 486-6119

INVOICE

2(h)

AUGUST 6, 1997

CLIENT REF. :
INVOICE NO. : 00802108
PROJECT NO. : 731397-T1
CLIENT NO. : 71275

TO: CANTON DROP FORGE, INC.
4575 SOUTHWAY STREET
CANTON, OHIO 44706

ATTN: MR. KEITH HOUSEKNECHT

PLEASE REMIT TO:
PARSONS ENGINEERING SCIENCE, INC
FILE 91849
LOS ANGELES, CALIFORNIA 90074-1849

FOR: CANTON DROP FORGE LAGDON #1/BIOCELL
AUTHORIZATION: P.O. #98072
AMOUNT AUTHORIZED: $19,108.90
AMOUNT BILLED: $16,565.77

BILLING PERIOD: 6/28/97 THROUGH 7/25/97

	HOURS	CURRENT PERIOD THROUGH 7/25/97
WBS 01000 - ASSESSMENT		
DIRECT LABOR	10.0	$300.21
OH & PROFIT @1.95 X D.L.		$585.40
ODCS WITHOUT HANDLING		$88.25
ODCS W/HANDLING Rate		$660.00
Markup: 10%		$66.00
SUBTOTAL:		$1,699.86
TOTAL THIS INVOICE:		$1,699.86

CDF001611

CLIENT REF.:
INVOICE NO.: 00802108
PROJECT NO.: 731397-T1
CLIENT NO..: 71275
FORMAT NAME: SBLRLBR15C

	EMPLOYEE NAME	ADJ. DATE	REGULAR HOURS	O/T HOURS	TOTAL HOURS	BILLING RATE	LABOR BILLING	PREMIUM BILLING
25	SENIOR SPECIALIST II							
	DELORIS A COLLINS		1.00		1.00	47.00	46.99	
	CLASSIFICATION TOTALS		1.00		1.00		46.99	
30	SENIOR SPECIALIST I							
	THOMAS A MC CREARY		3.50		3.50	69.84	244.47	
	CLASSIFICATION TOTALS		3.50		3.50		244.47	
85	PRINC ENG/SCIENTIST II							
	ALAN J RESNIK		1.00		1.00	80.22	80.21	
	ALAN J RESNIK	06/27/97	.50		.50	80.22	40.12	
	CLASSIFICATION TOTALS		1.50		1.50		120.33	
90	PRINC ENG/SCIENTIST I							
	EDWARD J KARKALIK		4.00		4.00	118.46	473.82	
	CLASSIFICATION TOTALS		4.00		4.00		473.82	
	TOTAL LABOR BILLING		10.00		10.00		885.61	

DETAIL OF PROFESSIONAL SERVICES
FOR THE PERIOD ENDING 7/25/97

CLIENT REF.:
INVOICE NO.: 00802108
PROJECT NO.: 731397-T1
CLIENT NO..: 71275
FORMAT NAME: SBLRLBR11C

W/E DATE	EMPLOYEE NAME	EMPLOYEE CLASSIFICATION	ADJ. DATE	RATE	REGULAR HOURS	O/T HOURS	TOTAL HOURS
01000	ASSESSMENT						
7/04/97	EDWARD J KARKALIK	PRINC ENG/SCIENTIST I		118.46	2.00		2.00
7/04/97	ALAN J RESNIK	PRINC ENG/SCIENTIST II	06/27/97	80.22	.50		.50
7/11/97	EDWARD J KARKALIK	PRINC ENG/SCIENTIST I		118.46	2.00		2.00
7/11/97	THOMAS A MC CREARY	SENIOR SPECIALIST I		69.84	3.50		3.50
7/11/97	DELORIS A COLLINS	SENIOR SPECIALIST II		47.00	1.00		1.00
7/11/97	ALAN J RESNIK	PRINC ENG/SCIENTIST II		80.22	1.00		1.00
	ITEM TOTALS				10.00		10.00
	TOTAL LABOR HOURS				10.00		10.00

DETAIL OF OTHER DIRECT COSTS
FOR THE PERIOD ENDING 7/25/97
BY WBS/COST CODE

INVOICE NO.: 00802108
PROJECT NO.: 731397-T1
CLIENT NO..: 71275
FORMAT NAME: SBLRFODC03
REF:

REFERENCE NUMBER	DESCRIPTION OF EXPENSES	AMOUNT
01000: ASSESSMENT		
9540	FREIGHT/EXPRESS/POSTAGE	3.00
9550	REPRODUCTION CHARGES	61.50
9560	COMMUNICATIONS	18.15
9570	CAD/GIS/COMPUTERS	5.60
9605	CONSULTING SERVICES-APPLIED CONSTRUCTION	660.00
	ASSESSMENT	748.25
	GRAND TOTAL OTHER DIRECT COSTS	748.25

DETAIL OF OTHER DIRECT COSTS
FOR THE PERIOD ENDING 7/25/97
BY JOB/WBS/COST CODE

CLIENT REF.:
INVOICE NO.: 00802108
PROJECT NO.: 731397-T1
CLIENT NO..: 71275
FORMAT NAME: SBLRODCWTT

REF NO.	EQUIP/ VEND NO.	NAME	INVOICE DATE	DATE WORKED	DESCRIPTION	BATCH NO.	AMOUNT
731397	CANTON DROP FORGE LAGOON #1/BI						
	01000 ASSESSMENT						
	9543 POSTAGE						
	00052			7/18/97	POSTAGE	86	3.00
					ACCOUNT TOTAL		3.00
	9551 COPIER CHARGES						
	30270			7/18/97	COPIER CHARGES	94	2.30
	30270			7/18/97	COPIER CHARGES	94	59.20
					ACCOUNT TOTAL		61.50
	9561 TELEPHONE CHARGES						
079701147	40470	EDWARD J KARKALIK	6/27/97			390	11.72
	00051			7/11/97	TELEPHONE CHARGES	85	2.30
	00051			7/18/97	TELEPHONE CHARGES	86	4.13
					ACCOUNT TOTAL		18.15
	9573 MICRO-COMPUTER						
	25001			7/18/97	MICRO-COMPUTER - CHARGES	87	5.60
					ACCOUNT TOTAL		5.60
	9605 CONSULTING SERVICES						
079709034	J7509	APPLIED CONSTRUCTION TECHNOLOG	7/14/97			395	660.00
					ACCOUNT TOTAL		660.00
					ASSESSMENT		748.25
					JOB 731397 TOTAL		748.25
					TOTAL, OTHER DIRECT COSTS		748.25

PARSONS ENGINEERING SCIENCE, INC.

REMIT PAYMENT TO:
File 91849
Los Angeles, CA 90074-1849
Attn: Accounts Receivables

Street Address:
19101 VILLAVIEW ROAD, SUITE 301
CLEVELAND, OHIO 44119

Tel: (216) 486-9005
Fax: (216) 486-6119

2(6)

I N V O I C E

AUGUST 6, 1997

CLIENT REF. :
INVOICE NO. : 00802108
PROJECT NO. : 731397-T1
CLIENT NO. : 71275

TO: CANTON DROP FORGE, INC.
4575 SOUTHWAY STREET
CANTON, OHIO 44706

ATTN: MR. KEITH HOUSEKNECHT

PLEASE REMIT TO:
PARSONS ENGINEERING SCIENCE, INC
FILE 91849
LOS ANGELES, CALIFORNIA 90074-1849

FOR: CANTON DROP FORGE LAGDON #1/BIOCELL
AUTHORIZATION: P.O. #98072
AMOUNT AUTHORIZED: $19,108.90
AMOUNT BILLED: $16,565.77

BILLING PERIOD: 6/28/97 THROUGH 7/25/97

	HOURS	CURRENT PERIOD THROUGH 7/25/97
WBS 01000 - ASSESSMENT		
DIRECT LABOR	10.0	$300.21
OH & PROFIT @1.95 X D.L.		$585.40
ODCS WITHOUT HANDLING		$88.25
ODCS W/HANDLING Rate		$660.00
Markup: 10%		$66.00
SUBTOTAL:		$1,699.86
TOTAL THIS INVOICE:		$1,699.86

CDF001616

CLIENT REF.:
INVOICE NO.: 00802108
PROJECT NO.: 731397-T1
CLIENT NO..: 71275
FORMAT NAME: SBLRLBR15C

	EMPLOYEE NAME	ADJ. DATE	REGULAR HOURS	O/T HOURS	TOTAL HOURS	BILLING RATE	LABOR BILLING	PREMIUM BILLING
25	SENIOR SPECIALIST II							
	DELORIS A COLLINS		1.00		1.00	47.00	46.99	
	CLASSIFICATION TOTALS		1.00		1.00		46.99	
30	SENIOR SPECIALIST I							
	THOMAS A MC CREARY		3.50		3.50	69.84	244.47	
	CLASSIFICATION TOTALS		3.50		3.50		244.47	
85	PRINC ENG/SCIENTIST II							
	ALAN J RESNIK		1.00		1.00	80.22	80.21	
	ALAN J RESNIK	06/27/97	.50		.50	80.22	40.12	
	CLASSIFICATION TOTALS		1.50		1.50		120.33	
90	PRINC ENG/SCIENTIST I							
	EDWARD J KARKALIK		4.00		4.00	118.46	473.82	
	CLASSIFICATION TOTALS		4.00		4.00		473.82	
	TOTAL LABOR BILLING		10.00		10.00		885.61	

DETAIL OF PROFESSIONAL SERVICES
FOR THE PERIOD ENDING 7/25/97

CLIENT REF.:
INVOICE NO.: 00802108
PROJECT NO.: 731397-T1
CLIENT NO..: 71275
FORMAT NAME: SBLRLBR11C

W/E DATE	EMPLOYEE NAME	EMPLOYEE CLASSIFICATION	ADJ. DATE	RATE	REGULAR HOURS	O/T HOURS	TOTAL HOURS
01000	ASSESSMENT						
7/04/97	EDWARD J KARKALIK	PRINC ENG/SCIENTIST I		118.46	2.00		2.00
7/04/97	ALAN J RESNIK	PRINC ENG/SCIENTIST II	06/27/97	80.22	.50		.50
7/11/97	EDWARD J KARKALIK	PRINC ENG/SCIENTIST I		118.46	2.00		2.00
7/11/97	THOMAS A MC CREARY	SENIOR SPECIALIST I		69.84	3.50		3.50
7/11/97	DELORIS A COLLINS	SENIOR SPECIALIST II		47.00	1.00		1.00
7/11/97	ALAN J RESNIK	PRINC ENG/SCIENTIST II		80.22	1.00		1.00
	ITEM TOTALS				10.00		10.00
	TOTAL LABOR HOURS				10.00		10.00

DETAIL OF OTHER DIRECT COSTS
FOR THE PERIOD ENDING 7/25/97
BY WBS/COST CODE

INVOICE NO.: 00802108
PROJECT NO.: 731397-T1
CLIENT NO..: 71275
FORMAT NAME: SBLRFODC03
REF:

REFERENCE NUMBER	DESCRIPTION OF EXPENSES	AMOUNT
01000: ASSESSMENT		
9540	FREIGHT/EXPRESS/POSTAGE	3.00
9550	REPRODUCTION CHARGES	61.50
9560	COMMUNICATIONS	18.15
9570	CAD/GIS/COMPUTERS	5.60
9605	CONSULTING SERVICES-APPLIED CONSTRUCTION	660.00
	ASSESSMENT	748.25
	GRAND TOTAL OTHER DIRECT COSTS	748.25

DETAIL OF OTHER DIRECT COSTS
FOR THE PERIOD ENDING 7/25/97
BY JOB/WBS/COST CODE

CLIENT REF.:
INVOICE NO.: 00802108
PROJECT NO.: 731397-T1
CLIENT NO..: 71275
FORMAT NAME: SBLRODCWTT

REF NO.	EQUIP/ VEND NO.	NAME	INVOICE DATE	DATE WORKED	DESCRIPTION	BATCH NO.	AMOUNT
731397	CANTON DROP FORGE LAGOON #1/BI						
01000	ASSESSMENT						
9543	POSTAGE						
00052				7/18/97	POSTAGE	86	3.00
					ACCOUNT TOTAL		3.00
9551	COPIER CHARGES						
30270				7/18/97	COPIER CHARGES	94	2.30
30270				7/18/97	COPIER CHARGES	94	59.20
					ACCOUNT TOTAL		61.50
9561	TELEPHONE CHARGES						
079701147	40470	EDWARD J KARKALIK	6/27/97			390	11.72
00051				7/11/97	TELEPHONE CHARGES	85	2.30
00051				7/18/97	TELEPHONE CHARGES	86	4.13
					ACCOUNT TOTAL		18.15
9573	MICRO-COMPUTER						
25001				7/18/97	MICRO-COMPUTER - CHARGES	87	5.60
					ACCOUNT TOTAL		5.60
9605	CONSULTING SERVICES						
079709034	J7509	APPLIED CONSTRUCTION TECHNOLOG	7/14/97			395	660.00
					ACCOUNT TOTAL		660.00
					ASSESSMENT		748.25
					JOB 731397 TOTAL		748.25
					TOTAL, OTHER DIRECT COSTS		748.25

PARSONS ENGINEERING SCIENCE, INC.

REMIT PAYMENT TO:
File 91849
Los Angeles, CA 90074-1849
Attn: Accounts Receivables

Street Address:
19101 VILLAVIEW ROAD, SUITE 301
CLEVELAND, OHIO 44119

Tel: (216) 486-9005
Fax: (216) 486-6119

I N V O I C E

2(b)

JULY 11, 1997

CLIENT REF. :
INVOICE NO. : 00755148
PROJECT NO. : 731397-T1
CLIENT NO. : 71275

TO: CANTON DROP FORGE, INC.
4575 SOUTHWAY STREET
CANTON, OHIO 44706

ATTN: MR. KEITH HOUSEKNECHT

PLEASE REMIT TO:
PARSONS ENGINEERING SCIENCE, INC
FILE 91849
LOS ANGELES, CALIFORNIA 90074-1849

FOR: CANTON DROP FORGE LAGDON #1/BIOCELL
AUTHORIZATION: P.O. #98072
AMOUNT AUTHORIZED: $19,509.00 → 17,909

BILLING PERIOD: 5/31/97 THROUGH 6/27/97

	CUR. HOURS	CURRENT PERIOD THROUGH 6/27/97	CUM. HOURS	CUMULATIVE-TO-DATE THROUGH 6/27/97
WBS 01000 - ASSESSMENT				
DIRECT LABOR	11.5	$429.38	81.5	$2,766.20
OH & PROFIT @1.95 X D.L.		$837.28		$5,394.08
ODCS WITHOUT HANDLING		$201.21		$519.36
ODCS W/HANDLING Rate		$.00		$5,891.69
Markup: 5%		$.00		$294.58
SUBTOTAL:		$1,467.87		$14,865.91
WBS 02000 - DRAINAGE DESIGN				
DIRECT LABOR		$.00	13.0	$396.03
OH & PROFIT @1.95 X D.L.		$.00		$772.26
ODCS WITHOUT HANDLING		$31.61		$31.61
SUBTOTAL:		$31.61		$1,199.90
TOTAL THIS INVOICE:		$1,499.48		$16,065.81

Amt OK'd
GN 7/29/97

CLIENT REF.:
INVOICE NO.: 00755148
PROJECT NO.: 731397-T1
CLIENT NO..: 71275
FORMAT NAME: SBLRLBR15C

EMPLOYEE NAME	ADJ. DATE	REGULAR HOURS	O/T HOURS	TOTAL HOURS	BILLING RATE	LABOR BILLING	PREMIUM BILLING
85 PRINC ENG/SCIENTIST II							
ALAN J RESNIK		4.50		4.50	80.22	360.96	
ALAN J RESNIK	06/20/97	2.00-		2.00-	80.22	160.42-	
CLASSIFICATION TOTALS		2.50		2.50		200.54	
90 PRINC ENG/SCIENTIST I							
EDWARD J KARKALIK		8.00		8.00	118.46	947.65	
GORDON J MELLE		1.00		1.00	118.48	118.47	
CLASSIFICATION TOTALS		9.00		9.00		1,066.12	
TOTAL LABOR BILLING		11.50		11.50		1,266.66	

DETAIL OF PROFESSIONAL SERVICES
FOR THE PERIOD ENDING 6/27/97

CLIENT REF.:
INVOICE NO.: 00755148
PROJECT NO.: 731397-T1
CLIENT NO..: 71275
FORMAT NAME: SBLRLBR11C

W/E DATE	EMPLOYEE NAME	EMPLOYEE CLASSIFICATION	ADJ. DATE	RATE	REGULAR HOURS	O/T HOURS	TOTAL HOURS
01000	ASSESSMENT						
6/06/97	EDWARD J KARKALIK	PRINC ENG/SCIENTIST I		118.46	2.00		2.00
6/06/97	GORDON J MELLE	PRINC ENG/SCIENTIST I		118.48	1.00		1.00
6/06/97	ALAN J RESNIK	PRINC ENG/SCIENTIST II		80.22	.50		.50
6/13/97	EDWARD J KARKALIK	PRINC ENG/SCIENTIST I		118.46	4.00		4.00
6/20/97	ALAN J RESNIK	PRINC ENG/SCIENTIST II		80.22	2.00		2.00
6/27/97	EDWARD J KARKALIK	PRINC ENG/SCIENTIST I		118.46	2.00		2.00
6/27/97	ALAN J RESNIK	PRINC ENG/SCIENTIST II		80.22	2.00		2.00
6/27/97	ALAN J RESNIK	PRINC ENG/SCIENTIST II	06/20/97	80.22	2.00-		2.00-
	ITEM TOTALS				11.50		11.50
	TOTAL LABOR HOURS				11.50		11.50

DETAIL OF OTHER DIRECT COSTS
FOR THE PERIOD ENDING 6/27/97
BY WBS/COST CODE

INVOICE NO.: 00755148
PROJECT NO.: 731397-T1
CLIENT NO..: 71275
FORMAT NAME: SBLRFODC03
REF:

REFERENCE NUMBER	DESCRIPTION OF EXPENSES	AMOUNT
01000: ASSESSMENT		
9540	FREIGHT/EXPRESS/POSTAGE	.78
9550	REPRODUCTION CHARGES	11.00
9560	COMMUNICATIONS	60.63
9570	CAD/GIS/COMPUTERS	128.80
	ASSESSMENT	201.21
02000: DRAINAGE DESIGN		
9550	REPRODUCTION CHARGES	.60
9560	COMMUNICATIONS	8.11
9570	CAD/GIS/COMPUTERS	22.90
	DRAINAGE DESIGN	31.61
	GRAND TOTAL OTHER DIRECT COSTS	232.82

CLIENT REF.:
INVOICE NO.: 00755148
PROJECT NO.: 731397-T1
CLIENT NO..: 71275
FORMAT NAME: SBLRODCWTT

REF NO.	EQUIP/ VEND NO.	NAME	INVOICE DATE	DATE WORKED	DESCRIPTION	BATCH NO.	AMOUNT
731397 CANTON DROP FORGE LAGOON #1/BI							
01000 ASSESSMENT							
9543 POSTAGE							
	00052			6/26/97	POSTAGE	486	.78
					ACCOUNT TOTAL		.78
9551 COPIER CHARGES							
	30270			6/13/97	COPIER CHARGES	91	2.60
	30270			6/26/97	COPIER CHARGES	97	6.40
	30270			6/26/97	COPIER CHARGES	97	.60
	30270			6/26/97	COPIER CHARGES	97	1.40
					ACCOUNT TOTAL		11.00
9561 TELEPHONE CHARGES							
	00051			6/20/97	TELEPHONE CHARGES	102	6.63
					ACCOUNT TOTAL		6.63
9562 FAX CHARGES							
	00015			6/13/97	FAX CHARGES	81	3.00
	00015			6/13/97	FAX CHARGES	85	3.00
	00015			6/20/97	FAX CHARGES	87	13.00
	00015			6/20/97	FAX CHARGES	87	34.00
	00015			6/26/97	FAX CHARGES	488	1.00
					ACCOUNT TOTAL		54.00
9573 MICRO-COMPUTER							
	25001			6/20/97	MICRO-COMPUTER - CHARGES	88	17.10
	25001			6/20/97	MICRO-COMPUTER - CHARGES	88	20.00
	25001			6/20/97	MICRO-COMPUTER - CHARGES	88	1.90
	25001			6/20/97	MICRO-COMPUTER - CHARGES	88	6.10
	25001			6/20/97	MICRO-COMPUTER - CHARGES	88	3.50
	25001			6/20/97	MICRO-COMPUTER - CHARGES	88	10.00
	25001			6/20/97	MICRO-COMPUTER - CHARGES	88	2.90

CLIENT REF.:
INVOICE NO.: 00755148
PROJECT NO.: 731397-T1
CLIENT NO..: 71275
FORMAT NAME: SBLRODCWTT

REF NO.	EQUIP/ VEND NO.	NAME	INVOICE DATE	DATE WORKED	DESCRIPTION	BATCH NO.	AMOUNT
	25001			6/20/97	MICRO-COMPUTER - CHARGES	88	.80
	25001			6/20/97	MICRO-COMPUTER - CHARGES	88	40.00
	25001			6/20/97	MICRO-COMPUTER - CHARGES	88	1.30
	25001			6/20/97	MICRO-COMPUTER - CHARGES	88	25.20
					ACCOUNT TOTAL		128.80
					ASSESSMENT		201.21
02000	DRAINAGE DESIGN						
9551	COPIER CHARGES						
	30270			6/13/97	COPIER CHARGES	91	.60
					ACCOUNT TOTAL		.60
9561	TELEPHONE CHARGES						
	00051			6/20/97	TELEPHONE CHARGES	102	3.11
					ACCOUNT TOTAL		3.11
9562	FAX CHARGES						
	00015			6/13/97	FAX CHARGES	81	3.00
	00015			6/13/97	FAX CHARGES	81	2.00
					ACCOUNT TOTAL		5.00
9573	MICRO-COMPUTER						
	25001			6/20/97	MICRO-COMPUTER - CHARGES	88	3.60
	25001			6/20/97	MICRO-COMPUTER - CHARGES	88	.10
	25001			6/20/97	MICRO-COMPUTER - CHARGES	88	12.40
	25001			6/20/97	MICRO-COMPUTER - CHARGES	88	6.80
					ACCOUNT TOTAL		22.90
					DRAINAGE DESIGN		31.61
					JOB 731397 TOTAL		232.82
					TOTAL, OTHER DIRECT COSTS		232.82

PARSONS ENGINEERING SCIENCE, INC.

REMIT PAYMENT TO:
File 91849
Los Angeles, CA 90074-1849
Attn: Accounts Receivables

Street Address:
19101 VILLAVIEW ROAD, SUITE 301
CLEVELAND, OHIO 44119

Tel: (216) 486-9005
Fax: (216) 486-6119

I N V O I C E

2(6)

JULY 11, 1997

CLIENT REF. :
INVOICE NO. : 00755148
PROJECT NO. : 731397-T1
CLIENT NO. : 71275

TO: CANTON DROP FORGE, INC.
4575 SOUTHWAY STREET
CANTON, OHIO 44706

ATTN: MR. KEITH HOUSEKNECHT

PLEASE REMIT TO:
PARSONS ENGINEERING SCIENCE, INC
FILE 91849
LOS ANGELES, CALIFORNIA 90074-1849

FOR: CANTON DROP FORGE LAGDON #1/BIOCELL
AUTHORIZATION: P.O. #98072
AMOUNT AUTHORIZED: $19,509.00

BILLING PERIOD: 5/31/97 THROUGH 6/27/97

	CUR. HOURS	CURRENT PERIOD THROUGH 6/27/97	CUM. HOURS	CUMULATIVE-TO-DATE THROUGH 6/27/97
WBS 01000 - ASSESSMENT				
DIRECT LABOR	11.5	$429.38	81.5	$2,766.20
OH & PROFIT @1.95 X D.L.		$837.28		$5,394.08
ODCS WITHOUT HANDLING		$201.21		$519.36
ODCS W/HANDLING Rate		$.00		$5,891.69
Markup: 5%		$.00		$294.58
SUBTOTAL:		$1,467.87		$14,865.91
WBS 02000 - DRAINAGE DESIGN				
DIRECT LABOR		$.00	13.0	$396.03
OH & PROFIT @1.95 X D.L.		$.00		$772.26
ODCS WITHOUT HANDLING		$31.61		$31.61
SUBTOTAL:		$31.61		$1,199.90
TOTAL THIS INVOICE:		$1,499.48		$16,065.81

CDF001627

CLIENT REF.:
INVOICE NO.: 00755148
PROJECT NO.: 731397-T1
CLIENT NO..: 71275
FORMAT NAME: SBLRLBR15C

	EMPLOYEE NAME	ADJ. DATE	REGULAR HOURS	O/T HOURS	TOTAL HOURS	BILLING RATE	LABOR BILLING	PREMIUM BILLING
85	PRINC ENG/SCIENTIST II							
	ALAN J RESNIK		4.50		4.50	80.22	360.96	
	ALAN J RESNIK	06/20/97	2.00-		2.00-	80.22	160.42-	
	CLASSIFICATION TOTALS		2.50		2.50		200.54	
90	PRINC ENG/SCIENTIST I							
	EDWARD J KARKALIK		8.00		8.00	118.46	947.65	
	GORDON J MELLE		1.00		1.00	118.48	118.47	
	CLASSIFICATION TOTALS		9.00		9.00		1,066.12	
	TOTAL LABOR BILLING		11.50		11.50		1,266.66	

DETAIL OF PROFESSIONAL SERVICES
FOR THE PERIOD ENDING 6/27/97

CLIENT REF.:
INVOICE NO.: 00755148
PROJECT NO.: 731397-T1
CLIENT NO..: 71275
FORMAT NAME: SBLRLBR11C

W/E DATE	EMPLOYEE NAME	EMPLOYEE CLASSIFICATION	ADJ. DATE	RATE	REGULAR HOURS	O/T HOURS	TOTAL HOURS
01000	ASSESSMENT						
6/06/97	EDWARD J KARKALIK	PRINC ENG/SCIENTIST I		118.46	2.00		2.00
6/06/97	GORDON J MELLE	PRINC ENG/SCIENTIST I		118.48	1.00		1.00
6/06/97	ALAN J RESNIK	PRINC ENG/SCIENTIST II		80.22	.50		.50
6/13/97	EDWARD J KARKALIK	PRINC ENG/SCIENTIST I		118.46	4.00		4.00
6/20/97	ALAN J RESNIK	PRINC ENG/SCIENTIST II		80.22	2.00		2.00
6/27/97	EDWARD J KARKALIK	PRINC ENG/SCIENTIST I		118.46	2.00		2.00
6/27/97	ALAN J RESNIK	PRINC ENG/SCIENTIST II		80.22	2.00		2.00
6/27/97	ALAN J RESNIK	PRINC ENG/SCIENTIST II	06/20/97	80.22	2.00-		2.00-
	ITEM TOTALS				11.50		11.50
	TOTAL LABOR HOURS				11.50		11.50

DETAIL OF OTHER DIRECT COSTS
FOR THE PERIOD ENDING 6/27/97
BY WBS/COST CODE

INVOICE NO.: 00755148
PROJECT NO.: 731397-T1
CLIENT NO..: 71275
FORMAT NAME: SBLRFODC03
REF:

REFERENCE NUMBER	DESCRIPTION OF EXPENSES	AMOUNT
01000: ASSESSMENT		
9540	FREIGHT/EXPRESS/POSTAGE	.78
9550	REPRODUCTION CHARGES	11.00
9560	COMMUNICATIONS	60.63
9570	CAD/GIS/COMPUTERS	128.80
	ASSESSMENT	201.21
02000: DRAINAGE DESIGN		
9550	REPRODUCTION CHARGES	.60
9560	COMMUNICATIONS	8.11
9570	CAD/GIS/COMPUTERS	22.90
	DRAINAGE DESIGN	31.61
	GRAND TOTAL OTHER DIRECT COSTS	232.82

CLIENT REF.:
INVOICE NO.: 00755148
PROJECT NO.: 731397-T1
CLIENT NO..: 71275
FORMAT NAME: SBLRODCWTT

REF NO.	EQUIP/ VEND NO.	NAME	INVOICE DATE	DATE WORKED	DESCRIPTION	BATCH NO.	AMOUNT
731397	CANTON DROP FORGE LAGOON #1/BI						
01000	ASSESSMENT						
9543	POSTAGE						
	00052			6/26/97	POSTAGE	486	.78
					ACCOUNT TOTAL		.78
9551	COPIER CHARGES						
	30270			6/13/97	COPIER CHARGES	91	2.60
	30270			6/26/97	COPIER CHARGES	97	6.40
	30270			6/26/97	COPIER CHARGES	97	.60
	30270			6/26/97	COPIER CHARGES	97	1.40
					ACCOUNT TOTAL		11.00
9561	TELEPHONE CHARGES						
	00051			6/20/97	TELEPHONE CHARGES	102	6.63
					ACCOUNT TOTAL		6.63
9562	FAX CHARGES						
	00015			6/13/97	FAX CHARGES	81	3.00
	00015			6/13/97	FAX CHARGES	85	3.00
	00015			6/20/97	FAX CHARGES	87	13.00
	00015			6/20/97	FAX CHARGES	87	34.00
	00015			6/26/97	FAX CHARGES	488	1.00
					ACCOUNT TOTAL		54.00
9573	MICRO-COMPUTER						
	25001			6/20/97	MICRO-COMPUTER - CHARGES	88	17.10
	25001			6/20/97	MICRO-COMPUTER - CHARGES	88	20.00
	25001			6/20/97	MICRO-COMPUTER - CHARGES	88	1.90
	25001			6/20/97	MICRO-COMPUTER - CHARGES	88	6.10
	25001			6/20/97	MICRO-COMPUTER - CHARGES	88	3.50
	25001			6/20/97	MICRO-COMPUTER - CHARGES	88	10.00
	25001			6/20/97	MICRO-COMPUTER - CHARGES	88	2.90

CLIENT REF.:
INVOICE NO.: 00755148
PROJECT NO.: 731397-T1
CLIENT NO..: 71275
FORMAT NAME: SBLRODCWTT

REF NO.	EQUIP/ VEND NO.	NAME	INVOICE DATE	DATE WORKED	DESCRIPTION	BATCH NO.	AMOUNT
	25001			6/20/97	MICRO-COMPUTER - CHARGES	88	.80
	25001			6/20/97	MICRO-COMPUTER - CHARGES	88	40.00
	25001			6/20/97	MICRO-COMPUTER - CHARGES	88	1.30
	25001			6/20/97	MICRO-COMPUTER - CHARGES	88	25.20
					ACCOUNT TOTAL		128.80
					ASSESSMENT		201.21
02000	DRAINAGE DESIGN						
9551	COPIER CHARGES						
	30270			6/13/97	COPIER CHARGES	91	.60
					ACCOUNT TOTAL		.60
9561	TELEPHONE CHARGES						
	00051			6/20/97	TELEPHONE CHARGES	102	3.11
					ACCOUNT TOTAL		3.11
9562	FAX CHARGES						
	00015			6/13/97	FAX CHARGES	81	3.00
	00015			6/13/97	FAX CHARGES	81	2.00
					ACCOUNT TOTAL		5.00
9573	MICRO-COMPUTER						
	25001			6/20/97	MICRO-COMPUTER - CHARGES	88	3.60
	25001			6/20/97	MICRO-COMPUTER - CHARGES	88	.10
	25001			6/20/97	MICRO-COMPUTER - CHARGES	88	12.40
	25001			6/20/97	MICRO-COMPUTER - CHARGES	88	6.80
					ACCOUNT TOTAL		22.90
					DRAINAGE DESIGN		31.61
					JOB 731397 TOTAL		232.82
					TOTAL, OTHER DIRECT COSTS		232.82

PARSONS ENGINEERING SCIENCE, INC.

REMIT PAYMENT TO:
File 91849
Los Angeles, CA 90074-1849
Attn: Accounts Receivables

Street Address:
19101 VILLAVIEW ROAD, SUITE 301
CLEVELAND, OHIO 44119

Tel: (216) 486-9005
Fax: (216) 486-6119

I N V O I C E

2(b)

MAY 6, 1997

CLIENT REF. :
INVOICE NO. : 00696664
PROJECT NO. : 731397-T1
CLIENT NO. : 71275

TO: CANTON DROP FORGE, INC.
4575 SOUTHWAY STREET
CANTON, OHIO 44706

ATTN: MR. KEITH HOUSEKNECHT

PLEASE REMIT TO:
PARSONS ENGINEERING SCIENCE, INC
FILE 91849
LOS ANGELES, CALIFORNIA 90074-1849

FOR: CANTON DROP FORGE LAGDON #1/BIOCELL
AUTHORIZATION: P.O. #98072
AMOUNT AUTHORIZED: $17,909.00

BILLING PERIOD: PROJECT INITIATION THROUGH 4/25/97

	CUR. HOURS	CURRENT PERIOD THROUGH 4/25/97	CUM. HOURS	CUMULATIVE-TO-DATE THROUGH 4/25/97
WBS 01000 - ASSESSMENT				
DIRECT LABOR	14.0	$402.53	14.0	$402.53
OH & PROFIT @1.95 X D.L.		$784.93		$784.93
ODCS WITHOUT HANDLING		$56.90		$56.90
SUBTOTAL:		$1,244.36		$1,244.36
TOTAL THIS INVOICE:		$1,244.36		$1,244.36

CDF001633

CLIENT REF.:
INVOICE NO.: 00696664
PROJECT NO.: 731397-T1
CLIENT NO..: 71275
FORMAT NAME: SBLRLBR15C

	EMPLOYEE NAME	ADJ. DATE	REGULAR HOURS	O/T HOURS	TOTAL HOURS	BILLING RATE	LABOR BILLING	PREMIUM BILLING
30	SENIOR SPECIALIST I							
	CAROL M BOWERS		.50		.50	85.24	42.63	
	CLASSIFICATION TOTALS		.50		.50		42.63	
80	SPVG ENG/SCIENTIST I							
	RICHARD W VOLPI	04/18/97	2.00		2.00	72.93	145.88	
	CLASSIFICATION TOTALS		2.00		2.00		145.88	
85	PRINC ENG/SCIENTIST II							
	ALAN J RESNIK		9.50		9.50	80.22	762.04	
	CLASSIFICATION TOTALS		9.50		9.50		762.04	
90	PRINC ENG/SCIENTIST I							
	EDWARD J KARKALIK		2.00		2.00	118.46	236.91	
	CLASSIFICATION TOTALS		2.00		2.00		236.91	
	TOTAL LABOR BILLING		14.00		14.00		1,187.46	

DETAIL OF PROFESSIONAL SERVICES

FOR THE PERIOD ENDING 4/25/97

CLIENT REF.:
INVOICE NO.: 00696664
PROJECT NO.: 731397-T1
CLIENT NO..: 71275
FORMAT NAME: SBLRLBR11C

W/E DATE	EMPLOYEE NAME	EMPLOYEE CLASSIFICATION	ADJ. DATE	RATE	REGULAR HOURS	O/T HOURS	TOTAL HOURS
01000	ASSESSMENT						
4/18/97	EDWARD J KARKALIK	PRINC ENG/SCIENTIST I		118.46	2.00		2.00
4/18/97	CAROL M BOWERS	SENIOR SPECIALIST I		85.24	.50		.50
4/18/97	ALAN J RESNIK	PRINC ENG/SCIENTIST II		80.22	7.00		7.00
4/25/97	RICHARD W VOLPI	SPVG ENG/SCIENTIST I	04/18/97	72.93	2.00		2.00
4/25/97	ALAN J RESNIK	PRINC ENG/SCIENTIST II		80.22	2.50		2.50
	ITEM TOTALS				14.00		14.00
	TOTAL LABOR HOURS				14.00		14.00

DETAIL OF OTHER DIRECT COSTS
FOR THE PERIOD ENDING 4/25/97
BY WBS/COST CODE

INVOICE NO.: 00696664
PROJECT NO.: 731397-T1
CLIENT NO..: 71275
FORMAT NAME: SBLRFODC03
REF:

REFERENCE NUMBER	DESCRIPTION OF EXPENSES	AMOUNT
01000: ASSESSMENT		
9550	REPRODUCTION CHARGES	.90
9580	EQUIPMENT/REPAIR/MAINT	56.00
	ASSESSMENT	56.90
	GRAND TOTAL OTHER DIRECT COSTS	56.90

CLIENT REF.:
INVOICE NO.: 00696664
PROJECT NO.: 731397-T1
CLIENT NO..: 71275
FORMAT NAME: SBLRODCWTT

REF NO.	EQUIP/ VEND NO.	NAME	INVOICE DATE	DATE WORKED	DESCRIPTION	BATCH NO.	AMOUNT
731397	CANTON DROP FORGE LAGOON #1/BI						
01000	ASSESSMENT						
9551	COPIER CHARGES						
30270				4/24/97	COPIER CHARGES	100	.30
30270				4/24/97	COPIER CHARGES	100	.60
					ACCOUNT TOTAL		.90
9588	MECH EQUIP REP & MAINT						
00212				4/24/97	MECH EQUIP REP & MAINT	103	9.00
00212				4/24/97	MECH EQUIP REP & MAINT	103	10.00
00212				4/24/97	MECH EQUIP REP & MAINT	103	5.00
00212				4/24/97	MECH EQUIP REP & MAINT	103	27.00
00122				4/24/97	MECH EQUIP REP & MAINT	103	5.00
					ACCOUNT TOTAL		56.00
					ASSESSMENT		56.90
					JOB 731397 TOTAL		56.90
					TOTAL, OTHER DIRECT COSTS		56.90

PARSONS ENGINEERING SCIENCE, INC.

19101 Villaview Road, Suite 301 • Cleveland, Ohio 44119 • (216) 486-9005 • Fax (216) 486-6119

PARESCL/497Dee/EJK7-11

11 April 1997

98073

Copy to Jerry 4/14/97 2(6)

Mr. Keith Houseknecht
CANTON DROP FORGE, INC.
4575 Southway Street
Canton, Ohio 44706

Dear Mr. Houseknecht:

In accordance with our discussions, including Messrs. Bill Cordier, Jerry Bressanelli, and yourself of Canton Drop Forge, Inc. (CDF) and Messrs. Gordon Melle and Ed Karkalik of Parsons Engineering Science, Inc. (Parsons ES), we submit the following proposal to address the biocell disposal and Lagoon #1 re-construction issues. A separate proposal, addressing condensate handling alternatives, will be forwarded under separate cover in the near future.

Parsons ES understands that CDF is interested in disposing of the materials accumulated in the biocell (located near Lagoon #2) and re-constructing Lagoon #1 for stormwater management in the most cost-effective and time-efficient manner possible. In our discussions, we jointly considered several different alternatives for these two efforts. These briefly included:

1) <u>for biocell material disposal</u>:
    a) transportation to and disposal in an appropriate landfill;
    b) stabilization and deposition in an on-site area to be re-surfaced with asphalt for parking;
    c) stabilization and deposition in a track (i.e., roadway) around the inside perimeter of the property;
    d) stabilization and deposition in a appropriate manner in Lagoon #1 as part of the backfill required to reduce Lagoon #1 capacity to that required for stormwater management;
    e) transportation and sale to Ashland's Canton Refinery for use as feedstock; or
    f) transportation and sale to a local cement kiln or asphalt plant for use as feedstock.
2) <u>for re-construction of Lagoon #1</u>:
    a) use of the biocell material, when encapsulated in clay layers and covered with an appropriate liner, or
    b) transportation of clean fill from an off-site source and installation of an appropriate liner.

In that alternatives (1)(d) and (2)(a) are highly synergistic, substantial added value (and, hence, cost and time savings) are projected for this approach in comparison with any other combination of alternatives. Consequently, attention will be focused on this approach, i.e., using biocell material, which has been appropriately stabilized for structural integrity as well as prevention of contaminant leaching, in the re-construction of Lagoon #1. The foregoing analysis will be confirmed as one of the tasks of our proposal, as outlined below.

It is further understood that CDF requires that the proposed actions, required to address the biocell material disposal and Lagoon #1 re-construction issues, be completed as expeditiously as practicable. Also, since CDF is under no orders or regulatory requirements concerning this work, CDF prefers to complete the proposed actions on a strictly voluntary basis. For this reason, Parsons ES will verify, in conjunction with CDF's legal counsel, that the proposed efforts can be completed under Voluntary Action Program (VAP) guidance. If applicable, this will permit closure of the biocell and Lagoon #1 issues, including the development of an NFA Letter by a Certified Professional, if CDF later chooses to do so, without agency interaction.

PROPOSED SCOPE OF WORK

Described below are the tasks required for achievement of CDF's project objectives. The amount of labor and the costs for labor and other direct costs (ODCs), including analytical laboratory expenses, are indicated for each task in Table 1.

Task 1 - Develop Sampling and Analysis Plan

Parsons will use a square pattern (grid pattern) and lay it over a map of the area in question. Each grid will be 30 feet by 30 feet. A number will be given to each grid intersection.

A random number generator will be used to select 10 sampling locations from the resulting zones of the grid.

Task 2 - Conduct Sampling

Parsons ES will collect 10 samples as defined in the Sampling and Analysis Plan. Each sample will be collected with a precleaned stainless steel trowel and placed in appropriate sample containers. Normal preservation and chain-of-custody procedures apply.

Task 3 - Complete Environmental and Geotechnical Analyses

Samples will be transported to a VAP certified laboratory (e.g., GEOAnalytical Laboratory in Twinsburg, Ohio) for ABN analysis and TPH analysis (DRO, GRO and 418.1). Results will be received 7 to 9 days after submittal.

A volume of soil will be transported to a geotechnical laboratory for testing to determine compressibility and stability. Testing will involve mixing known quantities of Portland cement or pozilime with site material. Testing will include standard proctor and unconfined compressive strength tests.

Task 4 - Review Results of Analyses

Following receipt of results of analyses from the environmental and geotechnical laboratories, Parsons ES will review the results in light of CDF's objectives and in accordance with the VAP requirements. (The applicability of using VAP guidance will be determined concurrently in Task 5 (see below). As a result of these efforts, a conceptual remedial design for treatment (if any, is required) of the biocell materials, will be completed. For example, if an admixture of Portland cement or lime is required to meet VAP compliance limits or for structural

stability, the ratios of biocell material to admixture will be determined. Also, the thickness of any clay layers will be estimated as part of this effort.

Task 5 - Review Freedom of Information Act (FOIA) Information for VAP Applicability

As part of a separate effort, CDF will arrange to collect all available information under the FOIA concerning CDF's compliance status. In particular, it will be useful to determine the specific reason(s) that Ohio EPA has included CDF's property on the Master Sites List (MSL).

Parsons ES will review relevant material collected by CDF to determine the applicability of using the VAP approach for closing the biocell and Lagoon #1. At this time, Parsons ES has no reason to suspect that VAP guidance cannot be used for this project.

The advantage of following VAP guidance are several, including:

1) VAP provides more flexibility and the least restrictive compliance limits of available regulatory approaches.
2) VAP provides a mechanism for obtaining a No Further Action (NFA) Letter, and, hence, closure of the remedial actions.
3) VAP procedures permit completion of all steps leading to and producing an NFA Letter voluntarily; i.e., without agency interaction.

Task 6 - Review Feasibility of Preferred Option

Next, Parsons ES will review the feasibility of completing the proposed actions within budgetary and scheduling constraints. In the background, we will also conduct a cursory screening of the original alternatives to ensure that, against economic, scheduling, technical and regulatory (e.g., VAP) criteria, the preferred option is still the best. Assuming that is true, Parsons ES will work with Beaver Excavating (and any other relevant parties, if required) to develop preliminary cost and schedule estimates to complete the preferred option.

Task 7 - Develop Letter Report

Parsons ES will develop a letter report highlighting the sampling methodology used, the analyses conducted, the results of analyses received, the implication of the analytical results, the conceptual design of the proposed action, applicability of VAP guidance, feasibility review results and preliminary cost and schedule estimates. The report will be issued in draft form for review with CDF prior to finalization (see Task 8 for review). Subsequent to receipt of comments, Parsons ES will revise the report, as appropriate.

Task 8 - Attend Review Meeting

Parsons ES will attend and participate in a meeting with CDF personnel to review the report indicated in Task 7. Although the meeting has been preliminarily scheduled for 22 May 1997, by expediting the previously defined tasks, Parsons ES believes that it can be moved forward by as much as 10 days (i.e., to 12 May 1997) provided that samples can be collected on or before the morning of 18 April 1997 and that the FOIA information is available by 1 May 1997.

PROPOSED BUDGET

Parsons ES proposes to complete the tasks defined above on a "time and expenses, total not-to-exceed" basis. Our estimate for this work, provided that is it completed within the timeframe described above, is $17, 909. Please refer to Table 1 for a detailed breakdown of this estimate.

PROJECT PERSONNEL

Primary project contribution for the described activities will be Messrs. Gordon Melle, Ed Karkalik and Richard Volpi. Copies of their resumes are enclosed.

TERMS AND CONDITIONS

Please refer to the enclosed Engineering Services Agreement (ESA) partially completed for the proposed services. Your endorsement and return (by facsimile is acceptable) of an executed copy of the ESA will serve as Parsons ES' notification to proceed.

Parsons ES is pleased to have this opportunity to be of service to Canton Drop Forge. If you would like additional information regarding this proposal, please contact Ed Karkalik at (216) 486-9005.

Very truly yours,

PARSONS ENGINEERING SCIENCE, INC.

Wilson H. Rownd, P.E.
Vice President/Manager

Edward J. Karkalik, P.E.
Project Manager

WHR/EJK/dee
cc: File 97290097003
Wilson H. Rownd (Parsons ES)
Carol M. Bowers (Parsons ES)

TABLE 1

PROPOSED PROJECT BUDGET

CANTON DROP FORGE, INC.
BIOCELL DISPOSAL / LAGOON #1 RE-CONSTRUCTION

Task # /Description	Hrs	Labor Cost	ODCs Cost	Total Cost
1 - Sampling and Analysis Plan	5	$469	$10	$479
2 - Sampling	10	$729	$100	$829
3 - Sample Analysis	1	$73	$7,650	$7,723
4 - Review Results	14	$1,294	$10	$1,304
5 - VAP Applicability	8	$948	$75	$1,023
6 - Feasibility Review	22	$2,203	$75	$2,278
7 - Letter Report	24	$2,102	$250	$2,352
8 - Review Meeting	16	$1,896	$25	$1,921
TOTAL	**100**	**$9,714**	**$8,195**	**$17,909**

98072

PARSONS ENGINEERING SCIENCE, INC.
19101 Villaview Road, Suite 301
Cleveland, Ohio 44119
(216) 486-9005
(216) 486-6119 (facsimile)

FACSIMILE MESSAGE

2(b)

TO: Mr. Keith Houseknecht
LOCATION: CANTON DROP FORGE, INC.
FAX NO.: (330) 477-2046
FROM: Ed Karkalik & Gordon Melle
DATE: 4 June 1997
NO. OF PAGES: 3

Dear Keith:

Based on our facsimile of 30 May 1997 and our telephone discussions since then, Parsons Engineering Science, Inc. (Parsons ES) has re-considered the cost estimates for the three options discussed previously. In the most recent activity, we have focused on cost savings ideas for the gravity discharge system from Lagoon #1 to Lagoon #2 (Option A); a pressure main discharge system from Lagoon #1 to the existing gravity sewer in/near Building A (Option B); and a pressure main system from Lagoon #1 to Lagoon #2. As before, in all three options, we have also included removal and disposal of the existing pump stand, installation of a new 8-inch line for the appropriate sections of the west side storm sewer and a new pump installation (for Options B and C only). Additional cost savings ideas proposed are included in a description of each option, as follows:

OPTION A: New Gravity Discharge from Lagoon #1 to Lagoon #2

Description of Cost Savings Approach: use a 6" (instead of 8") diameter line between Lagoons #1 and #2; install a new 8" diameter line along the western boundary for only 200 ft, leaving the line submerged for at least part of the time. In this approach, the water level can vary from elev. 1064 to about elev. 1069, depending on the level of Lagoon #1 at the start of the projected 25-year storm. Because this approach requires about 2 days to discharge the water to Lagoon #2, there is a risk that another significant rainfall will occur, creating an overflow situation. Note: in this option, $93,330 of the cost estimated are related to excavation and back-filling; changing line size does not affect this portion of the cost.

Re-align 8" storm sewer along west side of Upsetter Bldg (200 ft)	$11,200
Install new 6" gravity discharge line between Lagoons #1 & #2 (1200 ft)	115,740
Remove and dispose existing pump stand	3,000
Engineering design and construction inspection	13,000
TOTAL	**$142,940**

OPTION B: New Pressure Main from Lagoon #1 to Existing Gravity Sewer

Description of Cost Savings Approach: use existing 4" diameter line from separator discharge to gravity sewer; tie-in new 4" diameter line from Lagoon #1 pump discharge to separator discharge, including installation of check valves to prevent back-flow; use 3 HP pump. In this approach, two days will also be required to discharge the contents of Lagoon #1, allowing the level to rise to between elev. 1063 and 1068. There still is a probability (albeit of slightly lower risk) of overflowing Lagoon #1. More significantly, it is unlikely that both the Lagoon #1 and separator discharge can be operated concurrently. Increased operating surveillance would be required to ensure that either system was not jeopardized and that both are not operating simultaneously; otherwise, there is a risk that Lagoon #1 water could enter the separator or vice versa. Note: About $17,900 of this estimate is for excavating and back-filling the trenches required to install the proposed lines.

Re-align 8" storm sewer along west side of Upsetter Bldg (200 ft)	$11,200
Install new 4" pressure main from Lagoon #1 to separator discharge (250 ft)	13,000
Install new 3 HP pump and motor unit, foundation, electrical & appurtenances	9,000
Remove and dispose existing pump stand	3,000
Engineering design and construction inspection	4,000
TOTAL	**$40,200**

OPTION C: New Pressure Main from Lagoon #1 to Lagoon #2

Description of Cost Saving Approach: use a 4" diameter line from Lagoon #1 to #2; use a 3 HP pump. The primary concerns with this approach are that, while water levels will rise between elev. 1063 to elev. 1070, depending on the water level prior to the event, it will take 3 days to discharge the Lagoon's contents to pre-storm levels. As a result, there is a more significant risk that an overflow situation may occur at Lagoon #1. Note: About $49,600 of this estimate are required for excavation and back-filling activities.

Re-align 8" storm sewer along west side of Upsetter Bldg (200 ft)	$11,200
Install new 4" pressure main from Lagoon #1 to Lagoon #2 (1200 ft)	51,760
Install 3 HP new pump, foundation, electrical & appurtenances	9,000
Remove and dispose existing pump stand	3,000
Engineering design and construction inspection	7,500
TOTAL	**$82,460**

The following assumptions were used and/or apply to the above estimates:

- no hazardous waste disposal of the excavated soils and importation of clean fill will be required;
- underground utilities are limited to those identified by Keith Houseknecht in our telephone conversation on 29 May 1997;
- pavement replacement will be limited to that identified by Keith Houseknecht;
- pavement removed for installation of the gravity sewer will be disposed off-site;

- line sizes used in the examples above can result in upset conditions, as identified. Computer modeling completed by Ms. Elizabeth McCartney has identified the potential risks of experiencing these situations; and
- overall range of estimates is +/- 20%.

Mr. Gordon Melle and I will be prepared and available to discuss these estimates, their bases and possible permutations with you prior to and during the morning of Monday, 9 June 1997, commencing at 10:00 AM. Due to a scheduling conflict, only I will be able to participate in person at your office during this discussion; Gordon (and as required, Beth) will participate via teleconference. In the meantime, we are standing by for discussion of these various options and look forward to any other requirements which you may have in completing this phase of the biocell disposal and Lagoon #1 re-construction project. We look forward to continuing our support to you and Canton Drop Forge in this and any other environmental requirements which you may encounter.

Sincerely

Ed Karkalik

98072

PARSONS ENGINEERING SCIENCE, INC.
19101 Villaview Road, Suite 301
Cleveland, Ohio 44119
(216) 486-9005
(216) 486-6119 (facsimile)

2(b), 3(b)

FACSIMILE MESSAGE

TO:	Mr. Keith Houseknecht
LOCATION:	CANTON DROP FORGE, INC.
FAX NO.:	(330) 477-2046
FROM:	Ed Karkalik & Gordon Melle
DATE:	30 May 1997
NO. OF PAGES:	2

Dear Keith:
In follow-up to our telephone conversation on Thursday, 29 May 1997, Parsons Engineering Science, Inc. (Parsons ES) has re-analyzed the cost estimates for the three options discussed in our facsimiles of 29 May 1997. In particular, we have continued to focus our attention on a gravity discharge system from Lagoon #1 to Lagoon #2 (Option A); a pressure main discharge system from Lagoon #1 to the existing gravity sewer in/near Building A (Option B); and a pressure main system from Lagoon #1 to Lagoon #2. In all three options, we have also included removal and disposal of the existing pump stand, installation of a new 8-inch line for the appropriate sections of the west side storm sewer and a new pump installation (for Options B and C only). Cost estimates are as follows:

OPTION A: New Gravity Discharge from Lagoon #1 to Lagoon #2

Re-align 8" storm sewer along west side of Upsetter Bldg (380 ft)	$22,060
Install new 8" gravity discharge line between Lagoons #1 & #2 (1200 ft)	121,340
Remove and dispose existing pump stand	3,000
Engineering design and construction inspection	15,000
TOTAL	**$161,400**

OPTION B: New Pressure Main from Lagoon #1 to Existing Gravity Sewer

Re-align 8" storm sewer along west side of Upsetter Bldg (200 ft)	$11,200
Install new 6" pressure main from Lagoon #1 to gravity sewer (500 ft)	27,140
Install new pump, foundation, electrical & appurtenances	11,000
Remove and dispose existing pump stand	3,000
Engineering design and construction inspection	5,500
TOTAL	**$57,840**

OPTION C: New Pressure Main from Lagoon #1 to Lagoon #2

Re-align 8" storm sewer along west side of Upsetter Bldg (200 ft)	$11,200
Install new 6" pressure main from Lagoon #1 to Lagoon #2 (1200 ft)	56,740
Install new pump, foundation, electrical & appurtenances	11,000
Remove and dispose existing pump stand	3,000
Engineering design and construction inspection	9,000
TOTAL	**$90,940**

The following assumptions were used and/or apply to the above estimates:

1. no hazardous waste disposal of the excavated soils and importation of clean fill will be required;
2. underground utilities are limited to those identified by Keith Houseknecht in our telephone conversation on 29 May 1997;
3. pavement replacement will be limited to that identified by Keith Houseknecht;
4. pavement removed for installation of the gravity sewer will be disposed off-site;
5. line sizes used are those required to prevent upset conditions, as identified in computer modeling (see memorandum from Ms. Elizabeth McCartney of 29 May 1997).; and
6. overall range of estimates is +/- 20%.

Mr. Gordon Melle and I will be prepared and available to discuss these estimates, their bases and possible permutations with you during the first half of next week (week of 2 June 1997). Please advise of your intentions and/or requirements. We look forward to continuing our support to you and Canton Drop Forge in this and any other environmental requirements which you may encounter.

Sincerely

Ed Karkalik

9/072

C7 — C15 - DRO (ADVANCED ORGANICS) DIESEL FUEL 2(6)
GRO GASOLINE
~~GSCAN~~ GC ANALYSIS

5 SAMPLES
PARSONS TO GIVE SAMPLE PLAN } 5/16/97 - ED
SAMPLE COST — ED
ANALYSIS PROPOSAL — ED CHEMICAL FD PHYSICAL

CALLED STAN 4/14/97 PO = 98061
PLAN FOR TRIP — CHEM & PHYSICAL
* KEITH TO BRING IN BEAVER BY 4/18/97
ALL OK UNDER VOL. ACT. PROGRAM
RESULTS IN A NO FUTURE ACTION
RCRA - LANDFILL
STATE MASTER SITE LIST
WE ARE ON TOUT NO PRIORITY
DOESN'T KEEP US FROM VAP
WHERE DID THIS COME FROM? IS THIS A NO FURTHER ACTION LETTER
JERRY CALLED RICK
* RICK - FREEDOM INFORMATION ACT SOMETHING
CANTON - AIR ISSUE
SEARCH 4/14/97 DIDN'T FIND
TWINSBURG -
COLUMBUS -
* REVIEW EXPERT WITNESS, 4 QUESTIONS - KEITH HAS #1 ONLY
* TALK W/ STAN EVANS 5/22/97 MEETING
5/22/97 10:00

* TALK W/ MASSILON ON CONDENSATE

2(b)

4/15/97

DR JOHN COON & ED KARKACIK

WEAK BOND COEL - OK (JOHN - MAKES SENSE TO TRY FIRST)

IRON
FERRIC CHLORIDE
ALUMINUM SALT
POLYMER
} → COAGULANT

ULTRA FILTER → BOILER
35 PPM 4320 GPD

RESIDUAL OIL
CONTA - ULTRA FIL
POLYMER SALTS - MORE MINERALS IN BC
ACID CRACKING

~~ABCOR~~ ULTRA FILTER?

JOHN WILL CHECK ON
PPM OF OIL THAT BOILER CAN STAND
USE OF ULTRA SONIC TO BREAK EMULSION

9802

PARSONS ENGINEERING SCIENCE, INC.

19101 Villaview Road, Suite 301 • Cleveland, Ohio 44119 • (216)486-9005 • Fax:(216)486-6119

2(6)

TO: MR KEITH HOUSEKNECHT
LOCATION: CANTON DROP FORGE, INC.
RAPIDFAX NO.: (330) 477-2041
COPIES TO:

FROM: ED KARKALIK
LOCATION:
DATE: APRIL 17, 1997

TOTAL NUMBER OF PAGES 4 (including this cover letter)

IF YOU DO NOT RECEIVE ALL THE PAGES, PLEASE CALL BACK AS SOON AS POSSIBLE.
TELEPHONE NUMBER (216) 486-9005.

PARSONS ENGINEERING SCIENCE, INC.
CLEVELAND, OH 44119 – RAPIDFAX (216) 486-6119

DEAR KEITH -

THANKS FOR ACCEPTING OUR PROPOSAL. DUE TO A SCHEDULING CONFLICT, OF WHICH I WAS UNAWARE WHEN WE SPOKE THIS MORNING, MR. ALAN RESNIK WILL BE COMING TO SAMPLE TOMORROW, INSTEAD OF RICK VOLPE. MR RESNIK IS ONE OF OUR RESIDENT CERTIFIED PROFESSIONALS UNDER OHIO EPA'S VAP PROGRAM; HE WOULD BE INVOLVED IN CERTIFYING ANY INFORMATION DEVELOPED IN THIS EFFORT. ALAN'S RESUME IS ATTACHED. ALSO, ALAN WILL BE ARRIVING AT ABOUT 10:00 AM, AFTER COLLECTING SAMPLE JARS, REAGENTS, AND OTHER SUPPLIES FROM THE LAB. FINALLY, AN AFFADAVIT WILL BE REQUIRED TO ACCOMPANY THE SAMPLES, ONCE COLLECTED, TO THE LAB; A SAMPLE FORM - WHICH WE WILL COMPLETE - IS ATTACHED AS WELL.

REGARDS, ED

0200C01

JOB NUMBER 731397.01000

CDF001650

SAMPLE

FORM OF AFFIDAVIT

NAME OF AFFIANT _____

NAME AND ADDRESS OF PROPERTY FOR WHICH VOLUNTARY ACTION IS BEING CONDUCTED

_____

_____

_____

_____

PURPOSE FOR WHICH THE ATTACHED INFORMATION IS BEING SUBMITTED

_____

_____

_____

_____

IDENTIFICATION OF ALL INFORMATION SUBMITTED

_____

_____

_____

_____

The attached information is being submitted under the Ohio Voluntary Action Program. As affiant, and authorized representative of the Volunteer, it is my understanding that the property for which the voluntary action is being taken is eligible for the same, pursuant to rule 3745-300-02 of the Administrative Code and Section 3746.02 of the Revised Code. I further understand that the voluntary action is being conducted in compliance with all applicable laws and regulations. All information submitted by the affiant is intended for the purpose of completing a voluntary action for the referenced property, and to the extent known, is true, accurate and complete.

SIGNATURE OF AFFIANT_____DATE_____

Biographical Data

ALAN J. RESNIK

Certified Professional

EXPERIENCE SUMMARY

Extensive and diverse project management experience in more than eight years devoted to environmental consulting. Specialized experience in facility audits and assessments involving industrial and non-industrial properties. Significant background in contaminated site studies and asbestos management issues.

EXPERIENCE RECORD

1990-Date Parsons Engineering Science. **Program Manager**. Company-wide responsibilities for the environmental management program for Cummins Engine Company. Since 1992, this program has involved work at more than 40 facilities in 22 states and Canadian provinces. These projects have included compliance audits, pre-sale property audits, UST management, wastewater management (including design and construction of facilities), site assessments, permitting and other regulatory assistance, remedial design and remedial actions, and long-term monitoring. Negotiations with regulatory agencies have been a requirement for many of the projects including participation in State Voluntary Cleanup ("Brownfields") initiatives. Project deliverables include facility guidance documents encompassing management of hazardous materials, wastes, stormwater and pollution prevention, TSCA, SARA and OSHA compliance issues, closure documents, remedial investigations, reports and work plans.

Project Manager - Responsible for construction management and oversight for removal of 56 USTs and remediation of petroleum contaminated soil at Rickenbacker Air National Guard Base, Columbus, Ohio. Management responsibilities for UST and petroleum refinery closures and site investigations and industrial hazardous waste investigations, wastewater management, cleanup and risk assessment. Project Manager for a wide range of industrial and commercial clients who need environmental audits associated with commercial real-estate transactions (including regulatory compliance investigations and hazard assessments). Other related project management experience includes asbestos surveys, abatement design, contractor supervision and air monitoring.

Task Manager - Responsible for development of USAF Management Action Plan (MAP) environmental site summary and restoration and compliance strategies for two government owned contractor-operated facilities in Ohio (GE Jet Engines and McDonnell Douglas).

Served as an inspection team member in conducting the FAA Great Lakes Region internal OSHA Compliance Assessment Protocol (OSHCAP)/Environmental Compliance Assessment Protocol (ECAP)/Pollution Prevention Program (PPP) initiative in Michigan and Wisconsin in conjunction with the U.S. Army Corps of Engineers Buffalo District.

Produced regulated and hazardous waste and raw materials handling procedures documents and SARA Title III inventory studies for a large industrial concern. Oversees groundwater, soil sampling and monitor well installation under strict protocol at an aboveground storage tank release site. Performs hydrologic site assessments at petroleum hydrocarbon-contaminated sites and UST closure assessments. Also performs groundwater analytical laboratory data validation.

1989-1990 EssTek, Cleveland, Ohio. **District Manager.** Responsible for overall management of field and laboratory services for the Cleveland office of a nationwide consulting firm involved in asbestos risk management and industrial hygiene. Supervised a staff of 8 industrial hygienists, a lab manager and lab technician. Duties included budgeting, hiring, training, project cost estimating, marketing, sales, proposal generation, project design, QA/QC and general administration.

Presided over safety and preconstruction meetings with responsibility for project scheduling, bid documents, insurance and bonding and public relations. Designed sampling schemes for building surveys and contamination investigations with regard to degree of contamination, source and method of mitigation.

1987-1989 EssTek, Cleveland, Ohio. **Senior Industrial Hygienist.** Responsible for general industrial hygiene with respect to asbestos problems. Performed building surveys involving the location, identification, hazard assessment and recommendations for remediation of facilities with asbestos-containing materials (ACM). Supervised abatement contractor removal projects ensuring regulatory and contractual compliance. Performed project air sampling and on-site analysis while monitoring engineering controls designed to inhibit fiber release.

Performed risk assessments designed to prequalify abatement contractors for insurance suitability. Maintained insured contractor monitoring with project site inspections to ensure regulatory compliance and adherence to insurance requirements with particular regard to third party exposure, worker safety and general liability.

Laboratory responsibilities included analysis of asbestos air samples by Phase Contrast Microscopy (PCM) and analysis of bulk samples by Polarized Light Microscopy (PLM).

1986-1987 Petroleum Information, Englewood, Colorado. **Abstractor/Salesman.** Responsible for inside sales and customer service for oil and gas industry service company. Handled phone inquiries and personal visits from oil industry professionals interested in the leasehold, production, geological and geophysical maps and other products. Also responsible for abstracting and updating of oil and gas leasehold and production information on county base maps. Specifically in charge of providing information and map service subscriptions for customers involved in exploration and development in Michigan and California.

1985-1986 Q.C. Data Collectors, Inc., Denver, Colorado. **Digitizer.** Computer digitizing of various types of oil and gas well logs.

1985-1985 Chevron USA, Inc./Denver Temporaries, Denver, Colorado. **Geologic Support Technician.** Temporary position involving the indexing of regional studies, geological and geophysical prospect maps and reports and paleontological studies. Supplied geologic support data for exploration staff.

EDUCATION AND TRAINING

B.S. Geology, 1980, Ohio State University, Columbus, Ohio
M.S. Geology, 1984, The University of Toledo, Toledo, Ohio
McCrone Research Institute - Microscopical Identification of Asbestos
University of Cincinnati Institute of Environmental Health - NIOSH 582 - Sampling and Evaluating Airborne Asbestos Dust
Parsons Engineering Science Hazardous Waste Operations and Supervisory Training
Parsons Engineering Science Project Manager Training

PROFESSIONAL AFFILIATIONS

Certified Professional Geologist (Pennsylvania PG-002974-G)
Certified Ohio Asbestos Hazard Evaluation Specialist (Ohio #3310)
Certified Professional (CP #151) Under Ohio EPA Voluntary Action Program (VAP)

PAPERS AND PRESENTATIONS

"Heavy Metal Analysis of Bottom Sediments of Dillon Reservoir, Colorado." 1980 Senior Thesis.

"Petrological Analysis of the Butler Hill-Breadtray Granite Pluton, St. Francois Mountains, Southeast Missouri." 1984 Master's Thesis.

"The Identification of Heated Asbestos Fibers by Polarized Light Microscopy." EssTek Research Project 1988.

Biographical Data

JOHN H. KOON, Ph.D.

Technical Manager, Industrial and Hazardous Wastes

EXPERIENCE SUMMARY

Twenty-seven years of extensive technical experience combined with administrative and management responsibilities. Key contributor to significant advances in the technologies used worldwide in the treatment of industrial wastes; widely recognized as an authority in the evaluation and design of water and wastewater treatment systems. Has extensive experience in the evaluation and design of biological wastewater treatment systems. Assists clients in resolving complex environmental problems with state and federal regulatory agencies. Has worked with industries, defense agencies, and municipalities at over 200 locations. Has also directed projects dealing with the management of hazardous wastes including the development of remedial action plans for the correction of chemical contamination problems at numerous industrial and defense locations.

EXPERIENCE RECORD

1991-Date Parsons Engineering Science, Inc. **Vice President/Technical Manager, Industrial and Hazardous Wastes.** Directs industrial waste program and works with industrial clients to resolve difficult and complex issues. Responsible for providing technical direction on industrial and hazardous waste projects. Scope includes overseeing the development of project approaches to achieve desired results, participating in engineering investigations, and reviewing projects to ensure conformance to client needs.

Representative assignments include the following:

- Development of treatment system upgrades at a petrochemical complex for ARCO Chemical Co. Considerations were given to meeting RCRA land ban and wastewater treatment system exclusion regulations, anticipated Clean Air Act requirements, and NPDES requirements. Work included treatment testing and design assistance.
- Development of projected NPDES permit requirements and treatment upgrading alternatives to meet these requirements for five treatment systems at the Y-12 Plant in Oak Ridge, TN.
- Conduct of testing to evaluate air sparging, soil washing, and solidification to treat contaminated soil at an Arkansas Superfund site.
- Development of wastewater characterization and treatment system design requirements for a pharmaceutical plant operated by Pfizer, Inc.
- Stormwater and NPDES permitting assistance for BASF synthetic fibers plant.
- Technical support for a wastewater treatment system operating permit hearing in Texas for a new organic chemicals plant.

1983-1991 Post, Buckley, Schuh & Jernigan, Inc., **Vice President - Director of Industrial Services.** Directed the firm's work with industrial clients to insure completion of quality projects within time and budget constraints. Also responsible for the technical direction and quality control of major environmental projects.

Vice President - Manager of Industrial and Hazardous Waste Division (1988-1990). Directed technical, administrative, and business development operations for all industrial waste and hazardous waste projects.

Regional Manager - Nashville office (1983-1988). Responsible for technical direction, business development, administrative management, and financial performance of office. Directed project efforts to assure completion of projects within time and budget constraints. Developed

and supervised projects in industrial and municipal wastewater treatment system design including sludge handling, contaminated site remediation, and NPDES permitting. Representative assignments include the following:

- Conducted treatment investigations, process design development, detailed design development, construction assistance, and start-up assistance for a 1-mgd treatment facility for M&T Chemicals in Bucks, Alabama.
- Planned and designed new sludge handling facilities for the 100-mgd Central Wastewater Treatment Plant in Nashville, Tennessee.
- Developed a two-stage anaerobic-aerobic system to treat wastewater from a commercial baker's yeast plant.
- Directed the conduct of treatment investigations, process design development, detailed design development, construction engineering services, and start-up of an industrial pretreatment system for Reichhold Chemicals in Pensacola, Florida.
- Conducted RI/FS investigations at an air force base to remediate VOC-contaminated soil and groundwater.

1982-1983 John H. Koon Company, **President**. Responsible for all engineering work provided by the company; provided environmental engineering services for the treatment of industrial and municipal wastewaters, hazardous waste management, and expert testimony before regulatory agencies and courts of law.

1972-1982 AWARE, Inc., Nashville, Tennessee **Vice President/Technical Director; Manager of Operations Division** (1980-1982); **Director of Wastewater Management** (1974-1980); **Senior Engineer** (1972-1974). Played key role in the firm's emergence as one of the nation's leading industrial environmental management firms in the 1970s. Responsible for:

- Development of plans for remediating organic chemicals and mercury contamination at a plant producing chlorofluorocarbons, chlorine, and caustic.
- Development of treatment options for a specialty organic chemicals plant including waste characterization, waste minimization, treatment testing, permitting, and preliminary system design.
- Addressing a wide variety of wastewater management and permitting problems at 20 pulp and paper mills.
- Development of wastewater treatment strategies for a specialty organic chemicals plant operated by CIBA-GEIGY Corporation. Tasks included design and operational evaluation of an existing six-state trickling filter system and activated carbon adsorption; experimental testing of one- and two-stage combined systems using plant chemical and municipal wastewater to evaluate the treatment alternatives; planning and conduct of in-plant waste minimization measures to reduce waste loads; evaluation of sludge dewatering alternatives; system design.
- Development of treatment methods to handle highly saline wastes in various organic chemicals and textile plants.
- Participation in the development of a new anaerobic treatment system.
- Conduct of environmental investigations at an elemental phosphorus plant including development of wastewater treatment and reuse system, development of storm water management system, and evaluation of potential pollutant migration from on-site activated carbon system for removal of elemental phosphorus.

- Development of a wastewater treatment system for Nissan Manufacturing Corporation's Smyrna, Tennessee plant. The design included facilities for batch pH adjustment and coagulation of the wastewater, solids separation in a tube settler, and sludge dewatering using a belt filter press.

EDUCATION

B.E., Civil Engineering, 1967, Vanderbilt University, Nashville, Tennessee
M.S., Civil and Environmental Engineering, 1969, Vanderbilt University, Nashville, Tennessee
Ph.D., Environmental Engineering, 1971, University of California, Berkeley, California

PROFESSIONAL AFFILIATIONS

Registered Professional Engineer, (Alabama 1984, No. 14766; Florida 1987, No. 36964; Georgia 1991 No. 19285; Kentucky 1988, No. 15408; Tennessee 1973 No. 9590)
American Academy of Environmental Engineers (Diplomate)
American Society of Civil Engineers
American Water Works Association
International Association on Water Pollution Research and Control
Water Environment Federation (Program Committee; Hazardous Waste Committee; Industrial Waste Committee)

HONORARY AFFILIATIONS

Tau Beta Pi
Chi Epsilon

PUBLICATIONS

"Application of a Kinetic Analysis Using Historical Operating Data to Redesign an Industrial Activated Sludge System," *Proceedings of the 48th Purdue Annual Industrial Waste Conference*, 1993, coauthored by Fred L. Bogap.

"Meeting Self-Monitoring Requirements for Stormwater Discharges from Industrial Facilities," *Industrial Wastewater*, Vol. 1, No. 1, April 1993, coauthored by Samuel O. Atere-Roberts.

"Resolving Complex NPDES Permitting Issues at a Major Industrial Plant, " *Proceedings of the 1993 Food Industry Environmental Conference*, November 15-16, Georgia Tech Research Institute, Atlanta, Georgia.

"Evaluation of Chloroform Removal in a Biological Treatment System to Meet BAT Limits," *Proceedings of the 38th Annual Purdue Industrial Waste Conference*, 1983, coauthored by Yerachmiel Argaman.

"Development of a Wastewater Treatment System Based on a Fixed-Film, Anaerobic Bioreactor," *Proceedings of the DOE Workshop on Anaerobic Filters*, Howey-in-the-Hills, Florida, 1980, coauthored by G.M. Davis, R.K. Genung, and W.W. Pitt, Jr.

"Development of a Wastewater Management System for an Elemental Phosphorus Production Plant," *Proceedings of the 35th Annual Purdue Industrial Waste Conference*, 1980, coauthored by Gary M. Davis, Paul D. Knowlson, and Edward R. Smith.

"Energy Conservation and Scaleup Studies for a Wastewater Treatment System Based on a Fixed-Film,

Anaerobic Bioreactor," *Proceedings of the Second Symposium on Biotechnology in Energy Production and Conservation*, Gatlinburg, Tennessee, 1979, coauthored by G.M. Davis, R.K. Genung, and W.W. Pitt, Jr.

"The Feasibility of an Anaerobic, Upflow Fixed-Film Process for Treating Small Sewage Flows," *Proceedings of the Energy Optimization of Water and Wastewater Management for Municipal and Industrial Applications Conference*, 1979, coauthored by G.M. Davis, R.K. Genung, and W.W. Pitt, Jr.

"Handling of Liquid Wastestream from Coal Conversion Plants," *Proceedings of the Symposium on Biotechnology in Energy Production and Conservation*, May 1978, coauthored by Edward J. Reap, Gary M. Davis, and Carl E. Adams.

"The Economics of Handling Refinery Sludges," *Proceedings of the Second Open Forum on Management of Petroleum Refinery Wastewaters*, University of Tulsa, 1977, coauthored by Carl E. Adams, Jr.

"Treatment of Two Textile Dye House Wastewaters," *Proceedings of the 32nd Annual Purdue Industrial Waste Conference*, Purdue University, May 1977, coauthored by Gary M. Davis and Carl E. Adams, Jr.

"Wastewater Characteristics and Treatment Technology for the Liquification of Coal Using H-Coal Process," *Proceedings of the 32nd Annual Purdue Industrial Waste Conference*, 1977, coauthored by Edward J. Reap, Gary M. Davis, and Michael J. Duffy.

Evaluation and Upgrading of a Multi-Stage Trickling Filter Facility, U.S. EPA, Environmental Protection Technology Series, Report, 1976, coauthored by Robert Curran, Carl E. Adams, Jr., and W. Wesley Eckenfelder, Jr.

"Removal of Color from Vegetable Tanning Solution" *Journal of the Water Pollution Control Federation*, Vol. 47, No. 3, March, 1975. coauthors H.D. Tomlinson, E.L. Thackston, and P.A. Krenkel.

"Ammonia Removal from Municipal Wastewaters by Ion Exchange," *Journal of the Water Pollution Control Federation*, Vol. 47, No. 3, March, 1975, coauthor Warren J. Kaufman.

"Biological and Physical-Chemical Treatment of Waste from a Diversified Organic Chemical Plant," *Proceedings of the 30th Annual Purdue Industrial Waste Conference*, 1975, coauthored by Carl E. Adams, Jr.

"Planning for Industrial Wastewater Reuse in the Cleveland-Akron Area," *Proceedings of the National Conference on Complete WateReuse*, sponsored by AIChE, 1973, coauthored by Carl E. Adams, Jr., and W. Wesley Eckenfelder, Jr.

PAPERS AND PRESENTATIONS

"Resolving Complex NPDES Permitting Issues at a Major Synthetic Fiber Plant-I. Background Issues and Regular Agency Perspective, " presented at the KY-TN WPCA 47th Annual Meeting, 1993. Northern Kentucky, coauthored by Robert G. O'Dette.

"TSD for Water Quality-Based Toxics Control," presented at the Kentucky/Tennessee WPCA annual conference, Chattanooga, Tennessee, 1990.

"The Study of a Wastewater Management System for a Chlorinated Pesticide Manufacturing Facility," presented at the 73rd Annual Meeting of AIChE, Chicago, Illinois, 1980.

"Adsorption of Chlorinated and Nonchlorinated Organics from a Pesticide Manufacturing Plant Waste Stream," presented at the 53rd Annual Conference of the Water Pollution Control Federation, 1980, coauthored by Sam E. Shelby, Jr., Dan R. Marks, and H. Allen Scott.

"Treatment and Reuse of Water in an Elemental Phosphorus Plant," presented at the 53rd Annual Conference of the Water Pollution Control Federation, 1980, coauthored by Gary M. Davis, Ted T. Garret, and Sam Barco.

"Chemical Waste Disposal in the 80s," presented at the National Association for Purchasing Management, Chemical Group, Mid-winter Conference, Savannah, Georgia, 1980.

"Lagooning of Biological Sludges," presented at the Vanderbilt University Conference, 1980, coauthored by C. E. Adams, Jr.

"Anaerobic Treatment of Wastewater," presented at Vanderbilt University Workshop; "Design for 80s." March 1981, coauthored by Yerachmiel Argaman.

"The Use of Coagulation-Clarification Process in the Treatment of Textile Wastewaters," presented at the EPA Symposium on Textile Industry Technology, 1978.

"Trends and Directions in Achieving BAT Standards," presented to the Pulp Chemicals Association Environmental Meeting, Savannah, Georgia, 1978.

"The Implications of EPA's National Pretreatment Program Regulations," presented to Mobil Chemical Corporation Environmental Group, 1978.

"Cost-Effective Evaluation of Treatment Alternatives for a Heavy Metals Wastewater," presented at the 5th Annual Industrial Pollution Conference and Exposition, 1977.

"Oxygen Activated Sludge Considerations for Industrial Applications," presented at the 70th annual AIChE Meeting, 1977, New York, coauthored by W. Wesley Eckenfelder, Jr., Carl E. Adams, Jr., and Sam E. Shelby.

"Consideration of Wastewater Variability in the Design of Industrial Activated Sludge Systems," presented at the ASCE National Environmental Engineering Conference, 1977, coauthored by S.E. Shelby and W. Wesley Eckenfelder, Jr.

"Design of Activated Sludge Systems with Regard to High Salt Wastewaters," 1977, coauthored by Carl E. Adams, Jr., Edward J. Reap, and W. Wesley Eckenfelder, Jr.

"Optimization of Wastewater Treatment Facilities to Meet Both 1977 and 1983 Regulatory Criteria," presented at the 46th Annual Water Pollution Control Federation Conference, 1973, Cleveland, Ohio.

"Treatment Investigations and Process Design for the H-Coal Liquification Wastewater," 1976.

"Economic Aspects of Compliance with Proposed Toxant Pollutant Standards," presented at the 48th Annual Water Pollution Control Federation conference, 1975.

"Advanced Technology for Metals Removal," presented at the Matcon 1974 conference, Detroit, Michigan.

"Pretreatment Considerations for Industrial Wastewaters," presented to the State of New York WPCA, 1973.

"Economic Considerations for the Combined Treatment for Industrial Wastes in the Cleveland-Akron Area," presented at the 46th Annual Water Pollution Control Federation Conference, 1973, Cleveland, Ohio, coauthor by Carl E. Adams, Jr.

"Advanced Wastewater Treatment Technology," presented to the U.S. Army COE, 1972.

"Alternative Methods for Nitrogen Removal from Wastewater," presented at the Theory and Design of Advanced Waste Treatment Processes Seminar, Continuing Education in Engineering, University Extension and the College of Engineering, University of Berkeley, California, San Francisco, 1971.

SEMINARS AND WORKSHOPS

"Designing and Operating Groundwater Treatment System : Still Trying to Get It Right," presented at Executive Enterprises, 1993, Atlanta, Georgia.

"Industrial Requirements for Storm Water Permitting," presented to the Chemical Industry Council of North Carolina, 1991.

"Strategies for Complying with Storm Water Regulations," presented to the Coastal Carolina Section, AIChE, 1991.

"Strategies for Permitting Industrial Storm Water Discharges," seminars presented by Clemson University Continuing Engineering Education, 1991.

"Management of Leachate and Groundwater at Waste Disposal Sites," seminar presented by Vanderbilt University, 1986.

"Upgrading Aerated Lagoons to Achieve High Levels of BOD and Suspended Solids Removal," workshop sponsored by Municipal Environmental Research Laboratory, Clemson University, 1983.

"Wastewater Treatment," seminar presented by Southern Methodist University, 1983.

"Operation, Control, and Management of Activated Sludge Plants," seminar sponsored by Vanderbilt University, Continuing Engineering Education, Nashville, 1982 and 1986.

"Wastewater Engineering," seminar sponsored by Vanderbilt University, Continuing Engineering Education, Nashville, 1981 and 1986.

"Process Design and Water Quality Engineering," seminar sponsored by Vanderbilt University, School of Engineering, Department of EWRE, Arlington, 1981.

"A Conference for Industry on Complying with RCRA and Effluent/Pretreatment Guidelines," seminar sponsored by Industrial Waste Committee, California Water Pollution Control Association, Sacramento, 1981.

"Design for the Eighties," seminar sponsored by Vanderbilt University, Continuing Engineering Education, Nashville, 1981.

Series of four pretreatment seminars presented at major locations in Tennessee, sponsored by the state of Tennessee, 1980.

"Control, Operation and Management of Biological Wastewater Treatment Plants," seminar sponsored by Vanderbilt University, School of Engineering, Department of EWRE, Nashville, 1977, 1979, and 1980.

"The Use of the Coagulation-Clarification Process in the Treatment of Textile Wastewaters," presented at the Textile Industry Technology Seminar sponsored by Vanderbilt University, School of Engineering, Department of EWRE, Nashville, 1979.

"Management of Refining and Petrochemical Wastewaters," seminar sponsored by the University of Tulsa Continuing Education Division, College of Engineering and Physical Sciences, Tulsa, 1979.

"Upgrading of Wastewater Treatment Plants," seminar sponsored by Vanderbilt University, School of Engineering, Department of EWRE, Nashville, 1978 and 1979.

"Hazardous Waste Management," seminar sponsored by Vanderbilt University, School of Engineering, Department of EWRE, Nashville, 1978.

"Water Quality Engineering for Industry," AIChE Continuing Education Series, Chicago, 1977.

"Advanced Wastewater Treatment," AIChE Continuing Education Series, Chicago, 1977.

"Technical Preparation for Negotiating and Amending NPDES Permits," Legal and Regulatory Implications of Compliance and Noncompliance with NPDES Permits. Short Course sponsored by Auburn University, Birmingham, 1975.

"Advanced Wastewater Treatment," continuing education, sponsored by the Engineering Extension Service, Auburn University, Auburn, 1975.

"Optimization of Ammonia Removal by Ion Exchange Using Clinoptilolite," presented at Vanderbilt University, Department of Environmental and Water Resources Engineering, 1972.

2(6)

PARSONS ENGINEERING SCIENCE, INC.

19101 Villaview Road, Suite 301 • Cleveland, Ohio 44119 • (216)486-9005 • Fax:(216)486-6119

DATE: 4/16

TO: KEITH HOUSEKNECHT

LOCATION: CANTON DROP FORGE

RAPIDFAX NO.: (330) 477-2046

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FROM: ED KARICALIK

TOTAL NUMBER OF PAGES 8 (including this cover letter)

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We are herewith transmitting the following:

DATE	NO.	DESCRIPTION
		RESUME FOR DR. JOHN H. KOON, PE

DEAR KEITH -

JUST TO GIVE YOU SOME BACKGROUND ON DR KOON, JOHN HAS MORE RECENTLY (SINCE 1994) SERVED ON INTERNAL TEAMS WITH DUPONT, GM AND SEVERAL OTHER FIRMS, INCLUDING TRW FORGING OPERATIONS, FOR WASTE MINIMIZATION, POLLUTION PREVENTION AND WASTEWATER / PROCESS WATER TREATMENT PROJECTS. PLEASE REFER TO JOHN'S RESUME FOR AN INDICATION OF THE BREADTH OF HIS EXPERIENCE.

ED

JOB NO. 870046 07403

02000C02

CDF001662

2(b)

PARSONS ENGINEERING SCIENCE, INC.

19101 Villaview Road, Suite 301 • Cleveland, Ohio 44119 • (216)486-9005 • Fax:(216)486-6119

DATE: MAY 12, 1997

TO: KEITH HOUSEKNECHT

LOCATION: CANTON DROP FORGE

RAPIDFAX NO.: 330 - 477 - 2096

COPIES TO:

FROM: GORDON MELLE

TOTAL NUMBER OF PAGES 1 (including this cover letter)

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We are herewith transmitting the following:

DATE	NO.	DESCRIPTION

PCAP, & DRAWDOWN

KEITH,

TO KEEP THINGS MOVING, PLEASE ASK BEAVER EXCAVATING FOR BUDGET QUOTE TO MIX 2% LIME AND 10% FLY ASH (BY WEIGHT) TO THE MATERIAL WE PLAN TO PLACE IN THE BOTTOM OF LAGOON W/ EXCAVATION. ALSO, HAVE THEM GIVE BUDGET COST TO REMOVE THE OILY SOIL STILL AT THE BOTTOM OF THE LAGOON AND STABILIZE IT WITH LIME AND FLY ASH.

Thanks,
Gordon

STAN WILL HAVE $ EST. (ROUGH) BY FRI 5/16/97 FOR OUR MEETING

$ TO INCLUDE $ FOR LIME & FLY ASH

02000C02

JOB NO. 731397.01000

2(b)

RESICON ENGINEERING SERVICES, INC.

Engineering and Consulting Services

In response to industry demand, Resicon Inc., a broad based environmental services firm, established Resicon Engineering Services, Inc. Today, this company provides professional quality assurance and consulting services related to the geosynthetics industry.

Resicon Engineering Services, Inc. provides these services to clients in the engineering and design communities, as well as to facility owners and operators. These national and international clients benefit from the company's expertise with geosynthetic materials, from selection and formulation through installation and operational performance.

The information that follows will allow you to make a thorough evaluation of the firm's services and will prove helpful in the selection of a professional company to assist you with current and future geosynthetic projects.

Scope of Services

Resicon Engineering Services, Inc. provides the following services related to the selection, design, installation, and operation of geosynthetic systems:

Construction Quality Assurance Services

- Specification review of installation and QC/QA plan.
- Material certification at manufacturers facility.
- Evaluation of bidders, proposals, bid exceptions, etc.
- Comprehensive conformance and performance testing.
- Non-destructive testing of penetration boots.
- Comprehensive documentation, report preparation, and installation certification.

Consulting Services

- Design of geosynthetic membrane containment systems.
- Review of plans and specifications.
- Perform product compatibility and suitability studies.
- Destructive and non-destructive forensic investigations.
- Evaluation and troubleshooting of operational problems.

Construction Quality Assurance Services

The following outlines the construction quality assurance services Resicon Engineering Services recommends during the installation of geosynthetic membranes.

Resicon Engineering Services will provide a full-time, professional quality assurance manager, on-site, to monitor and record the installation and testing of flexible membrane liners in accordance with all engineering specifications. Activities typically include, but are not limited to, the following:

- Verify the manufacturer's quality control program through a factory audit of manfacturer's conformance test results for the specific material. Perform material acceptance, and release for shipment at point of manufacture.

- Perform an inspection of the liner material for shipping and handling damage as it arrives on-site.

- Document, with written and photographic records, the condition of the base to which the liner is applied. (Note: It is not typically the responsibility of the quality assurance firm to approve the base; rather the installation contractor and/or his QC inspector must accept the base as ready for installation.)

- Obtain an appropriate number of samples from separate rolls of lining material of sufficient size to allow for required conformance testing. As a minimum Resicon Engineering Services suggests that these tests should include:

    1) Density
    2) Melt index
    3) Tensile properties
    4) Thickness
    5) Carbon black content

- Prepare and maintain notes on the condition of the sheet surface of *each* roll as the sheet is deployed.

- Monitor, record and compile results of all trial seams; pressure, vacuum, tensile, or other specified testing procedures.

- Monitor field tensile testing of seam samples conducted by installers QC personnel. Verify, record, and compile all results.

- Choose the location of all seam detructive testing sites, label and have removed by the installer a seam sample of sufficient length to distribute a minimum of 12" to the owner or his representative; 12" to the installer; and the balance to an independent laboratory for testing as called for in the specification.

- Perform non-destructive testing of penetration boots.

- Prepare a daily report for the designated project manager.

- Observe and record weather conditions, including temperature, a minimum of once every four hours worked, plus any special, unusual, or noteworthy conditions encountered during installation.

- Maintain sufficient data and records to support the preparation and submission of the final membrane map that will identify the location of all rolls, seams, patches, and penetrations by a discreet numbering method.

- Prepare and submit for review a comprehensive final report. The report will include all data, documents and records produced during membrane installation, along with analysis of same in sufficient detail to support a conclusion of compliance with specifications. Also submit a letter stating, as a mattter of professional opinion, that compliance with plans and specifications has been achieved.

CONSTRUCTION QUALITY ASSURANCE
SAMPLE FINAL REPORT

TABLE OF CONTENTS

PROJECT EXPERIENCE

Construction Quality Assurance Assignments

With more than a decade of experience in the geosynthetic industry, Resicon, now Resicon Engineering Services, recognized the need for comprehensive construction quality assurance during the installation of geosynthetic membrane liners and offers this representative list of specific engagements:

1991	Rockingham County Brentwood, NH	QA services on waste water treatment plant lagoon liner; 100,000 s.f. 30 mil PVC.
1991	Hatch Hill Landfill Agusta, ME	QA services on Cell 1 and leacheate pond; 500,000 s.f. 40 and 80 mil. HDPE.
1991	Conway MSW Landfill Conway, NH	QA services on Phase 1 liner installation; 400,000 s.f. 80 mil. HDPE.
1990	Rockingham County Brentwood, NH	QA services on waste water treatment plant lagoon liner; 30,000 s.f. 30 mil PVC.
1990	CWS, Inc. Norridgewock, ME	QA services on Phase 5 liner installation; 102,000 s.f. 80 mil HDPE. Also annual leachate lagoon inspection.
1990	Town of Norway Norway, ME	QA services on two waste water containment lagoons; 650,000 s.f. 60 mil HDPE.
1990	SEMASS (Phase II) Carver, MA	QA services on ash containment landfill; double liner system, 300,000 s.f. 60 mil secondary and 300,000 s.f. 80 mil primary HDPE liner.
1990	City of Portsmouth Portsmouth, NH	QA services on ash containment landfill; 150,000 s.f. 60 mil HDPE liner and 150,000 s.f. 40 mil cap.
1989	CWS, Inc. Norridgewock, ME	QA services on installation of Phase 4 liner installation; 100,000 s.f. 80 mil HDPE plus annual leachate lagoon inspection.

1989	Georgia Pacific Corp. Woodlands, ME	QA services on installation of waste water lagoon liner; 70,000 s.f. 60 mil HDPE.
1988	Concord Regional MSW Franklin, NH	QA services on installation of regional ash landfill; 500,000 s.f. 80 mil HDPE.
1988	SEMASS (Phase I) Carver, MA	QA services on regional municipal landfill double liner system; 600,000 s.f. 80 mil HDPE.

Consulting and Project Management Assignments

Below is a representative list of engagements:

	ASSIGNMENT	BRIEF DESCRIPTION
1991	CMA Associates Conway, NY	Developed specification and provided peer review for Conway, NH landfill expansion.
1991	SGH Cambridge, MA	Consulted on underbuilding liner for methane containment and venting system.
1991	Johnson Company Montpelier, VT	Performed review of plans and specifications for The Johnson Company on the Lamoille Solid Waste District in central Vermont.
1991	Chenette Engineering Montpelier, VT	Provided design and consulting services for Palisades Landfill project in central Vermont.
1991	Wright-Pierce Mars Hill, ME	Performed review of plans and specifications of geosynthetics on Mars Hill project.
1991	Waste USA Coventry, VT.	Turn-key development of a privately owned landfill including permitting, design, and construction.
1989	City of Burlington Burlington, VT.	Fast-track design of double lined municipal landfill; 60 days from start of design to construction completion.

1987	Elders Resources Ltd. Mangana, Australia	Demonstrate testing procedures for HDPE leachate liner applications.
1985	LEC Ltd. Coventry, England	Develop procedures for installation of membrane liners in Europe and the Far East.
1983- 1984	SCA Services Pinewood, SC	Define seam testing criteria for extrusion welded polyethylene membrane.

PROFESSIONAL STAFF EXPERIENCE

Clark R. Gunness

Clark R. Gunness is President of Resicon Engineering Services, Inc. In that capacity, he is responsible for the overall operation of the company. He also provides technical and consulting services to clients.

Mr. Gunness has been involved in the geosynthetic industry for more than a decade. He has had extensive involvement in the development of both products and equipment, and in the implementation of quality assurance and control programs.

From resin selection to liner design to material selection, Mr. Gunness's achievements in the containment industry are well documented. He had been responsible for, directly or in an advisory role, the installation of over 15 million square feet of liner material. He has analyzed and tested a wide variety of liner materials, as well as reviewed countless installation details.

Working with Dow Chemical, Mr. Gunness established one of the first domestically produced polyethylene resins to see extensive use in North America. This resin was of the linear low density variety. Tests he developed and employed to qualify the resin were used in Europe and modified to American standards utilizing equipment he designed.

Mr. Gunness has consulted to companies, including The Badger Company, Consolidated Waste Services, Inc. and Cecos International on resin regarding resin selection and testing. He has advised lining manufacturers and contractors on the production and application of polymeric membranes in the U.S., Canada, Europe and Australia.

Mr. Gunness holds a bachelors degree from Harvard College. He also attended Babson College where he studied business administration. In the course of his career, Mr. Gunness has been widely published in both the trade and business press.

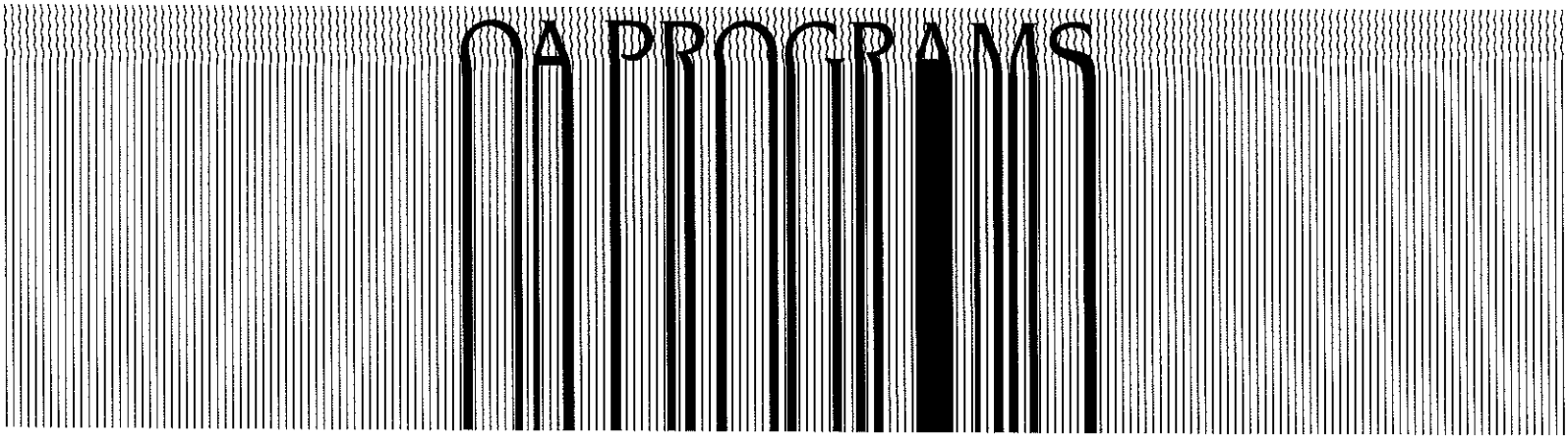
W. Robert Kelly, P.E.

W. Robert Kelly is Vice President of Resicon Engineering Services, Inc. based in the Sunapee, New Hampshire office. Bob specializes in providing engineering, technical, and management support services for the firm's private, and public clients. His experience, as an independent solid waste developer and consultant with over 12 years experience in the management of solid, liquid, and hazardous wastes, supplements his project management skills.

Bob has led project team efforts for recycling program implementation, transfer station design, MRF development and design, composting project study and development, landfill siting and design, and engineering costing analysis. As a startup partner for a solid waste project developer in western New York, Mr. Kelly was the conceptual designer and lead principal on three recycling and composting facility projects that combined MSW composting, a MRF, and a permanent HHW collection center. He currently is the project director on two integrated solid waste recycling facilities that his team is developing.

Mr. Kelly is responsible for proposal development, contract negotiations, study and design supervision, construction management, client contact, and project budgetary control for Resicon clients.

Mr. Kelly holds a B.A. from Dartmouth College in Engineering Sciences, as well as a B.E. from the Thayer School of Engineering. He is a registered engineer in Massachusetts, New Hampshire, Maine, Connecticut, and New York. He belongs to the American Society of Civil Engineers, and the American Management Association.


OA PROGRAMS

2(5) 9/07/2

ED KARKALIK
MAY 21, 1997
RE: BIOCELL

(1) IT IS MY UNDERSTANDING THAT ANY FLYASH, FROM THE CDF BOILER OR OTHER, WILL BE TESTED FOR PROPERTIES REQUIRED FOR THE BIOCELL.

(2) IT IS MY UNDERSTANDING THAT DESIGN, MAT'L & INSTALLATION COST FOR RAISING THE SEWER ON THE WEST SIDE OF THE UPSET BUILDING IS ENCLUDED IN THE COST ESTIMATED

(3) IT IS MY UNDERSTANDING THAT DESIGN MAT'L & INSTALLATION COST FOR THE DRAIN FROM LAGOON #1 TO LAGOON #2 IS ENCLUDED IN THE COST ESTIMATES.

(4) 1ST FULL ¶, 3RD LINE (OF THREE) SHOULD BE (OF TWO), I BELIEVE WE HAD 2 USTS AND ONE WAS REMOVED. (PAGE #3)

(5) HOW WILL DECISION TO STOP DIGGING OUT MAT'L FROM LAGOON #1 WALLS BE MADE?

(6) IS COST TO REMOVE & DISPOSE OF THE OLD PUMP STAND PIPE IN THE COST ESTIMATE?

Keith

CDF001678

CANTON DROP FORGE

2(b)

TELECOPIER COVER SHEET

PLEASE DELIVER THE FOLLOWING PAGES TO:

NAME: ED KARKALIK

FIRM: _____

CITY: _____

PHONE: ( ) _____ FAX: ( ) _____

FROM:

NAME: KEITH HOUSOZNOZHS

FIRM: CANTON DROP FORGE

CITY: Canton, OH

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PARSONS ENGINEERING SCIENCE, INC.
19101 Villaview Road, Suite 301 • Cleveland, Ohio 44119 • (216)486-9005 • Fax:(216)486-6119

DATE: 5/29/97

2(6)

TO: MR KEITH HOUSEKNECHT
LOCATION: CANTON DROP FORGE
RAPIDFAX NO.: 330-477-2046
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FROM: ED KARKALIK

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DATE	NO.	DESCRIPTION

KEITH -

BASED ON DISCUSSIONS WITH BEAVER, WE'VE RE-FOCUSED OUR ATTENTION SLIGHTLY:

(A) GRAVITY SYSTEM INCLUDES RE-DOING 430 FT OF 8" STORM SEWER ON WEST SIDE OF UPSETTER BLDG PLUS 1700 FT OF NEW 8" GRAVITY SEWER BETWEEN PONDS 1 AND 2. ALSO INCLUDES REMOVAL OF EXISTING PUMP STAND. $238,000

(B) PRESSURIZED SYSTEM INCLUDES RE-DOING 250 FT OF 8" STORM SEWER ON WEST SIDE, PLUS 500 FT OF NEW 6" PRESSURE MAIN FROM POND 1 TO GRAVITY SEWER IN/NEAR BLDG A, PUMP AND INSTALLATION APPURTENANCES AND REMOVAL OF EXISTING PUMP STAND. $100,000. [IF NEW PRESSURE MAIN IS INSTALLED FROM POND 1 TO POND 2, COST WOULD BE ABOUT $175,000].

COSTS ARE +/- 30% ESTIMATES. LINE INSTALLATIONS INCLUDE MANHOLES AT 300 FT SPACING, HAZWASTE DISPOSAL OF SOIL, CLEAN BACK-FILL, REPLACE PAVEMENT/DRIVES/FENCING, AS NEC.

JOB No. 73/397.02000

D2000C02

CDF001680

98072
2(6)

PARSONS ENGINEERING SCIENCE, INC.

19101 Villaview Road, Suite 301 • Cleveland, Ohio 44119 • (216)486-9005 • Fax:(216)486-6119

DATE: 5/20/97

TO: MR. KEITH HOUSEKNECHT
LOCATION: CANTON DROP FORGE
RAPIDFAX NO.: (330) 477-2046
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DATE	NO.	DESCRIPTION
		Revised p. 5, Table 3, Table 4 and pl of Appendix C of Report

Keith -

Attached are revised versions of the above-listed four (4) sheets of our draft Report, as discussed during our meet last Friday (5/16/97). These have been adjusted / revised to reflect the items discussed and conversations with and/or information received from American Land fill (at Waynet Beaver Excavating, and Ohio EPA (on a non-disclosure basis) since our meeting.

Please note that the costs of stabilizing the biocell material and placing same into Lagoon #1 have been adjusted and firmed to within a +/- 15% range. Costs for landfill disposal have similarly been refined. Also please note that American Land (and Central Waste in Alliance) have indicated that the biocell materi cannot be used for (daily) cover in that the TPH is too high, the material is too granular and it reduces space in the landfill.

Ed Karkalik

JOB NO. 731397.01000

02000G02

CDF001681

PER ED OEPA WAS AGREEABLE TO A SHORTER DURATION)

05/20/97 TUE 10:40 FAX 216 486 6119 PARSONS ES CLEVELAND 001

05/20/97 10:46 216 486 6119

THE BEAVER EXCAVATING COMPANY

RECEIVED
MAY 20 1997
CANTON DROP FORGE

May 16, 1997

2(b)

Canton Drop Forge
4575 Southway St. S.W.
Canton, Ohio 44706

Attention: Keith Houseknecht

Reference: Biocell Remediation

Gentlemen:

Per your request we are supplying the following budget figures:

1.) Stabilize biocell a.) 2% lime b.) 10% fly ash	3,000 cy @ $10.00/cy	$ 30,000.00
2.) Remove additional material in pond	600 cy @ $20.00/cy	$ 12,000.00
3.) 12" clay liner	600 cy @ $35.00/cy	$ 21,000.00
4.) Move & recompact biocell material	3,000 cy @ $10.00/cy	$ 30,000.00
5.) 6" clay cover	300 cy @ $35.00/cy	$ 10,500.00
6.) General conditions		$ 9,000.00
	BUDGET ESTIMATE	$112,500.00

Alternate: Haul material to American Waste Landfill (dump fees not included). (5,000-6,000 Ton) $10-15/Ton

Alternate: Haul material to Central Waste Alliance - (if acceptable) (5,000-6,000 Ton) $20-22/Ton

CDF001682

Clarifications:

1.) Note that clay material cannot be compacted on sides of pond as shown on detail.

2.) Ramp will be required for access to bottom of pond.

3.) Check your conversion factor of cubic yards to tons.

4.) A specification will need to be provided for permeability requirements of clay. Price will vary depending on grade of clay required.

Please note these are only rough budget figures. If you have any questions please feel free to call.

Thank You,

THE BEAVER EXCAVATING CO.

Stanley R. Evans
Project Manager

SRE:lf

THE BEAVER EXCAVATING COMPANY

Post-it® Fax Note 7671	Date 5/16/97	# of pages ▶ 2
To KEITH HOUSEKNECHT	From STAN EVANS	
Co./Dept.	Co.	
Phone #	Phone #	
Fax #	Fax #	

May 16, 1997

2(b)

Canton Drop Forge
4575 Southway St. S.W.
Canton, Ohio 44706

Attention: Keith Houseknecht

Reference: Biocell Remediation

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6.) General conditions		$ 9,000.00
	BUDGET ESTIMATE	$112,500.00

Alternate: Haul material to American Waste Landfill (dump fees not included). (5,000-6,000 Ton) $10-15/Ton

Alternate: Haul material to Central Waste Alliance - (if acceptable) (5,000-6,000 Ton) $20-22/Ton

CDF001684

Clarifications:

1.) Note that clay material cannot be compacted on sides of pond as shown on detail.

2.) Ramp will be required for access to bottom of pond.

3.) Check your conversion factor of cubic yards to tons.

4.) A specification will need to be provided for permeability requirements of clay. Price will vary depending on grade of clay required.

Please note these are only rough budget figures. If you have any questions please feel free to call.

Thank You,

THE BEAVER EXCAVATING CO.

Stanley R. Evans
Project Manager

SRE:lf

JB, BP, RZ, GM, EK

2(b)

Cost of Replacement Fill

List 1985 - 'Oily Wastes' - Low Priority

Ohio Master Site List - Cochin, Petra, etc.

Active, Inactive, No Comment * ODF

Interim VAP Rules out for 1yr & 5mo

Final 5 months - No Tank History

NFA - No Further Action -

IF NFA Goes to Agency $750 To Review Package

State will Covenant not to sue

500 - 1000 for Agency Review

20 - 50,000 for site closure & Cov. Not to Sue

25,000 or so for Just NFA.

Central

Ton/Cu Yd

#/cu ft

128 #/cu yd

3456

1.75 T/cu yd

+10 to 18% Moisture

PARSONS ENGINEERING SCIENCE, INC.
A UNIT OF PARSONS INFRASTRUCTURE & TECHNOLOGY GROUP INC

19101 Villaview Road, Suite 301 • Cleveland, Ohio 44119 • (216) 486-9005 • Fax (216) 486-6119
PARESCL/597/Dee/EJK7-7

15 May 1997

2(6)

Mr. Keith Houseknecht
CANTON DROP FORGE, INC.
4575 Southway Street
Canton, Ohio 44706

Reference: Canton Drop Forge, Inc. Lagoon #1 Re-construction and Biocell Disposal

Dear Mr. Houseknecht:

In accordance with our Scope of Work for the above-referenced project, Parsons Engineering Science, Inc. (Parsons ES) respectfully submits to Canton Drop Forge, Inc. (CDF) our report of progress completed to-date. In particular, the enclosed report summarizes the results of environmental and geotechnical analyses completed, feasibility analyses of several alternative approaches considered, and the conceptual design, budgetary cost estimate and preliminary schedule for implementing the recommended option for addressing these issues.

It is intended that the accompanying draft report will be reviewed with CDF engineering, management and legal staff during our meeting scheduled for Friday, 16 May 1997. After this meeting, Parsons ES will revise the report, as appropriate, reflecting the comments received in a final version of the report within two weeks of the meeting.

We look forward to providing continued environmental and process engineering support to Canton Drop Forge in this and other matters under consideration. Please contact either Mr. Gordon Melle or me at (216) 486-9005 for questions or additional information regarding this effort.

Very truly yours,

PARSONS ENGINEERING SCIENCE, INC.

Edward J Karkalik
asn

Edward J. Karkalik, PE
Project Manager

EJK/dee
cc: File 73139701000

CANTON DROP FORGE, INC.
LAGOON #1 RE-CONSTRUCTION/BIOCELL DISPOSAL
SUMMARY REPORT OF FEASIBILITY ANALYSES

Based on our Scope of Work for the entitled project, Parsons Engineering Science, Inc. (Parsons ES) respectfully submits to Canton Drop Forge, Inc. (CDF) this report. In the sections which follow, we summarize the results of the environmental and geotechnical analyses completed, the feasibility of several alternative approaches considered, and the conceptual design, budgetary cost estimate and preliminary schedule for implementing the recommended option for addressing the re-construction of Lagoon #1 and disposition of the biocell material.

SUMMARY OF CURRENT CONDITIONS

Sampling and Analysis Plan

Prior to sampling, a square grid pattern was lain over a copy of the map of the area which contained the material removed from Lagoon #1, i.e., the biocell (see Figure 1). The area of each grid section was 900 square feet (30 feet by 30 feet). A discrete number was given to each of the grid intersections (there are 77 intersection). A random number generator was then used to pick ten (10) grid intersection points which were then sampled in the field and submitted for analytical/environmental analysis. The samples were labeled CDF-1 through CDF-10. In addition, seven discrete sampling locations inside various grids were sampled and composited for geotechnical analysis. The sampling locations were labeled Geotech-1 through Geotech-7.

Samples which were obtained for analytical/environmental analyses were collected via hand at each selected sampling grid location. Samples were collected from approximately 0.5 feet below grade at each sample location. Sample material was placed directly into laboratory grade jars, sealed with screw-on Teflon-lined lids, place on ice in a cooler and transported to the laboratory. The samples were transported under chain-of-custody procedures to GeoAnalytical, Inc. laboratories in Twinsburg, Ohio for environmental and chemical analyses. Soil samples were analyzed following the Voluntary Action Program (VAP) protocol for total petroleum hydrocarbons, middle range organics (TPH-MRO, EPA method SW846-4015A (modified)), total petroleum hydrocarbons heavy range organics (TPH-HRO, EPA method SW846-4015A (modified)), TPH (EPA method 418.1), and semi-volatile organic compounds (SVOCs, EPA method SW846-8270B). Table 1 summarizes the analytical methods used for this effort.

The soil sample obtained for geotechnical analyses represented a composite of seven sampling locations (e.g., Geotech-1 through Geotech-7). Samples were collected from approximately 0.5 feet below grade at each sample location and placed in a 5-gallon bucket with a sealed lid. The sample material was transported to Applied Construction Technologies, Inc. (ACT) in Cleveland, Ohio for analysis and treatability testing. The composited sample material was mixed with varying amounts of lime and fly ash and subjected to the California Bearing Ratio test (ASTM D1883) to determine the resulting materials' relative bearing capacities. Four test runs were made, one each for the following soil, lime and fly ash mixtures:

- Biocell material with no lime and no fly ash;
- Biocell material with 2% lime and 10% fly ash;
- Biocell material with 6% lime and 22.5% fly ash; and
- Biocell material with 10% lime and 35% fly ash.

Results of Analyses

Table 2 presents the results of analytical and environmental testing for the soil samples collected for chemical analysis. Table 2 only summarizes compounds which were detected during analysis. The complete analytical reports received from GeoAnalytical, Inc. have been included as Appendix A. Please note that the "VAP Limits for Industrial Use Properties" displayed in Table 2 may only be used if the biocell material is deposited between two confining clay layers with vertical hydraulic conductivity of less than 10^{-5} cm/sec. If the biocell materials are enplaced in any other configuration, more conservative VAP limits will apply. It should also be noted that the oily nature of the sampled material caused matrix interference in the laboratory, producing elevated detection limits for SVOCs.

Results of geotechnical analyses and treatability testing are summarized in the table contained in Appendix B. These indicate that, for the soil, lime and fly ash mixtures tested, the second case (i.e., with 2% lime and 10% fly ash) produced the most desirable results. Please note that this mixture is not necessarily the ***optimal*** result; subsequent discussions with the laboratory have indicated that slightly lower additions of lime and fly ash may produce a mixture with an adequate bearing capacity.

Implications of Analytical Results

Implications of the environmental and chemical analytical results are such that the material contained in the biocell should be suitable for application following the guidance of the VAP regulations. There are no compounds, which are required to be analyzed under VAP, with values exceeding the limits provided in VAP's Generic Numerical Standards for industrial use properties [OAC 3745-300-08]. To apply these limits, CDF must agree to maintain this property in industrial use in perpetuity. Also, in the future, should CDF decide to obtain closure of this property (or the portion being addressed in this project), the entire VAP protocol must be completed, resulting in issuance of a No Further Action (NFA) Letter by a Certified Professional and, if desired, a Covenant Not To Sue (CNS) by Ohio EPA.

Implications of the geotechnical analytical and treatability testing results are that, in order to maintain structural integrity in future applications (see specifically options b, c, and f below), stabilization with lime and fly ash is required. Please note that the long-term effects of certain applications, i.e., specifically as wearing surfaces in track or roadway and parking applications, have not been tested and are difficult to predict. For example, CDF should be aware that exposure to traffic and the elements (e.g., sunlight, precipitation, etc.) may result in physical or chemical changes in the stabilized soil mixture, resulting in potentially undesirable effects.

RCRA characterization testing (previously completed by Hammontree & Associates, prior to removal of the biocell material from Lagoon #1) indicated that the material was non-hazardous. Hence, the options presented below are considered feasible without the need for pretreatment for environmental risk reduction (i.e., fixation to prevent leaching should not be required).

FEASIBILITY ANALYSES

FOIA Review for VAP Applicability

Based on information from Mr. Richard Zollinger, Esq. of CDF, the Freedom of Information Act (FOIA) searches conducted at Twinsburg (Ohio EPA, Northeast Ohio District), Columbus (Ohio EPA, Headquarters) and Chicago (US EPA, Region V) produced no information that would prohibit use of a VAP approach for disposition of biocell material and/or re-construction of Lagoon #1. Consequently, based on the results of the FOIA searches and the

environmental sampling and analyses summarized above, it has been determined that application of the VAP regulatory framework should provide guidance, which is acceptable to the major stakeholders (i.e., Ohio EPA, CDF), for this project.

Further review of CDF's operating and regulatory history has indicated that, at one time or another (but not necessarily currently), other regulatory frameworks may have been applicable. For instance, the underground storage tanks (USTs), at least one (of three) has since been removed, are operated under the jurisdiction of the Bureau of Underground Storage Tank Regulations (BUSTR). Also, the landfill, which was located in the vicinity of the biocell and has since been closed, was possibly regulated under the Resource Conservation and Recovery Act (RCRA). Additionally, the Ohio EPA's Master Sites List (MSL) includes the CDF property (EPA ID no. OHD004465142) as a "low priority" site, included in the MSL since 1985 due to an "oily wastes" problem. In any case, even with these additional regulatory considerations in the background, it appears reasonable to follow VAP guidance for the current project. It should be noted, however, that several additional steps, i.e., Phase I property assessment, NFA Letter, etc., are required before the Lagoon #1 and biocell areas of the CDF property can be considered "closed" under VAP guidance. In other words, completion of these actions will not result in a regulatory closure of this portion of the CDF property. These proposed actions have been developed consistent with the requirements of VAP, should CDF choose to seek closure in the future.

Alternative Approaches

In view of the potentially appropriate alternatives for the disposal of material contained in the biocell and concurrent re-construction of Lagoon #1, Parsons ES has considered the following approaches:

a) transportation to and disposal of the biocell material in an appropriately licensed off-site landfill;

b) stabilization, as described above for structural integrity, and deposition in an on-site area, which will later be re-surfaced with asphalt for parking;

c) stabilization, as described above for structural integrity, and deposition in an on-site area, which will be used as a track or roadway around the inside perimeter of the property;

d) transportation and sale to Ashland's Refinery in Canton for use as a feed-stock;

e) transportation and sale to a local asphalt plant for use as a feed-stock; and

f) stabilization, as described above for structural integrity, and deposition in an appropriate manner (see following section) in Lagoon #1 as part of the back-fill required to reduce the pond's capacity to that required for storm water management.

It should be noted that, in re-constructing Lagoon #1 for alternatives a, b, c, d, and e above, additional volumes of clean fill material (beyond that which may be required for option f), will be required in lieu of the volume of biocell material which is being used or disposed elsewhere and of the clay used to provide a lining under the layer of biocell material (enplaced in option f). Also, in all cases, a small, incremental volume of oil-impacted soil and water in Lagoon #1 must be removed prior to initiating any re-construction activities. Parsons ES proposes that, subject to CDF approval and subsequent to recovery of any free oil, the additional oily soil and water be transferred to the biocell and Lagoon #2, respectively. Finally, except for the nature of an internal layer of biocell material (as in option f), the emplacement sequence for re-construction of Lagoon #1 would be similar for all options listed above:

- clay layer;
- biocell material (option f only);

- clay layer (option f only);
- HDPE liner (optional, if required); and
- stabilization layer (optional, if required).

Please note that for options a through e, clean fill may be substituted for the lower clay layer indicated above.

Screening Criteria

As indicated in our Scope of Work, the following criteria were used to screen the alternatives listed previously: economic impact (i.e., overall costs); scheduling impact; technical feasibility (i.e., implementability); stakeholder (i.e., regulatory agency, customer, neighbor, stockholder) acceptability; and permitting requirements. Table 3 provides a summary of the screening criteria definitions (see footnotes). Additional details concerning the definitions of the screening criteria and their application are contained in Appendix C.

Results of Screening

After applying the screening criteria to the alternative approaches considered, Parsons ES identified a recommended option for further analysis. Table 3 provides the results of the alternatives screening exercise. The **recommended option**, as a result of the screening effort, is option f, the stabilization and transfer of biocell material for use in re-construction of Lagoon #1. This option is preferred because it is:

- cost-effective (minimizing costs of transporting soil in comparison to options a, d and e, which involve off-site shipment of biocell material and hauling of an equivalent volume of clean fill from off-site to the CDF property);
- time-efficient (reducing risks of scheduling impacts potentially caused by others, as in options a, d and e);
- technically feasible (e.g., and readily implementable, in comparison with options b, c, d and e, for which ease of implementation is either uncertain or perceived to be more difficult);
- acceptable to the primary stakeholders (e.g., the risk takers, including regulatory agencies and CDF, in comparison with options a, d and e for which future control cannot be assured); and
- low risk with respect to permitting (in comparison with options a, c and d, which may require "permits" for off-site transportation of the biocell material).

A conceptual description, cost estimate and preliminary schedule for this option are provided in the following section. Please note that, for the sake of comparison only, costing and scheduling information were developed and are provided for the off-site landfill disposal option. The off-site landfill disposal option is being used as the "base case" in this comparison with the preferred option.

RECOMMENDED OPTION

Conceptual Design

The conceptual design for the preferred option includes implementation of the following steps. Figure 2 provides a profile view of the resulting conceptual design. To implement this design, we recommend that CDF plan to:

- remove any residual oily soil which remains in Lagoon #1 and transfer it to the biocell;
- re-grade Lagoon #1, as necessary, to assure that the side-walls are stable;
- place and compact a 12-inch layer of clay, in two 6-inch lifts, to provide an impermeable lining in the Lagoon #1 excavation;
- in the biocell, add and mix 2% lime and 10% fly ash with the oily soil to stabilize it;
- transfer the stabilized mixture from the biocell to Lagoon #1;
- place and compact the stabilized biocell material in Lagoon #1; and
- place and compact one additional 6-inch layer of clay to cap and seal the surface of Lagoon #1.

Depending on the final size of Lagoon #1, excess stabilized biocell material may be available. Drainage and traffic considerations must be taken into account for the possible locations for on-site placement and compaction of this material. Appropriate consideration of these factors will preclude future erosion of this material from the property.

Budgetary Cost Estimate

Parsons ES has developed, working in conjunction with Beaver Excavating Company, a budgetary cost estimate (i.e., within +/- 15%) of $139,000 for the recommended option. This estimate is based on the assumptions that:

- about 3000 cubic yards of oily soil are available for stabilization in the biocell;
- about 600 cubic yards of additional oily soil must yet be removed from Lagoon #1;
- about 720 cubic yards of lime and flyash will be required to stabilize the biocell material; and
- about 600 cubic yards of clay will be required for the upper and lower layers lining the re-constructed Lagoon #1.

Table 4 contains the cost estimate, provided by major cost category. As an alternate, the base case of disposing of the biocell material in the American Landfill at Waynesburg (or alternatively at Central Waste in Alliance), with reconstruction of Lagoon #1 with virgin materials, is about $189,000.

Preliminary Schedule

It is projected that this recommended option, for re-constructing Lagoon #1 and addressing the disposition of the biocell material concurrently, can be accomplished within 9 to 10 weeks after CDF's issuance of an order to proceed. In particular, the final design for Lagoon #1 can be completed within 3-4 weeks. The construction phase of the project is anticipated to require about six (6) weeks.

RECOMMENDED OPTION

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- re-grade Lagoon #1, as necessary, to assure that the side-walls are stable;
- place and compact a 12-inch layer of clay, in two 6-inch lifts, to provide an impermeable lining in the Lagoon #1 excavation;
- in the biocell, add and mix 2% lime and 10% fly ash with the oily soil to stabilize it;
- transfer the stabilized mixture from the biocell to Lagoon #1;
- place and compact the stabilized biocell material in Lagoon #1; and
- place and compact one additional 6-inch layer of clay to cap and seal the surface of Lagoon #1.

Depending on the final size of Lagoon #1, excess stabilized biocell material may be available. Drainage and traffic considerations must be taken into account for the possible locations for on-site placement and compaction of this material. Appropriate consideration of these factors will preclude future erosion of this material from the property.

Budgetary Cost Estimate

Parsons ES has developed, working in conjunction with Beaver Excavating Company, a budgetary cost estimate (i.e., within +/- 30%) of $150,000 for the recommended option. This estimate is based on the assumptions that:

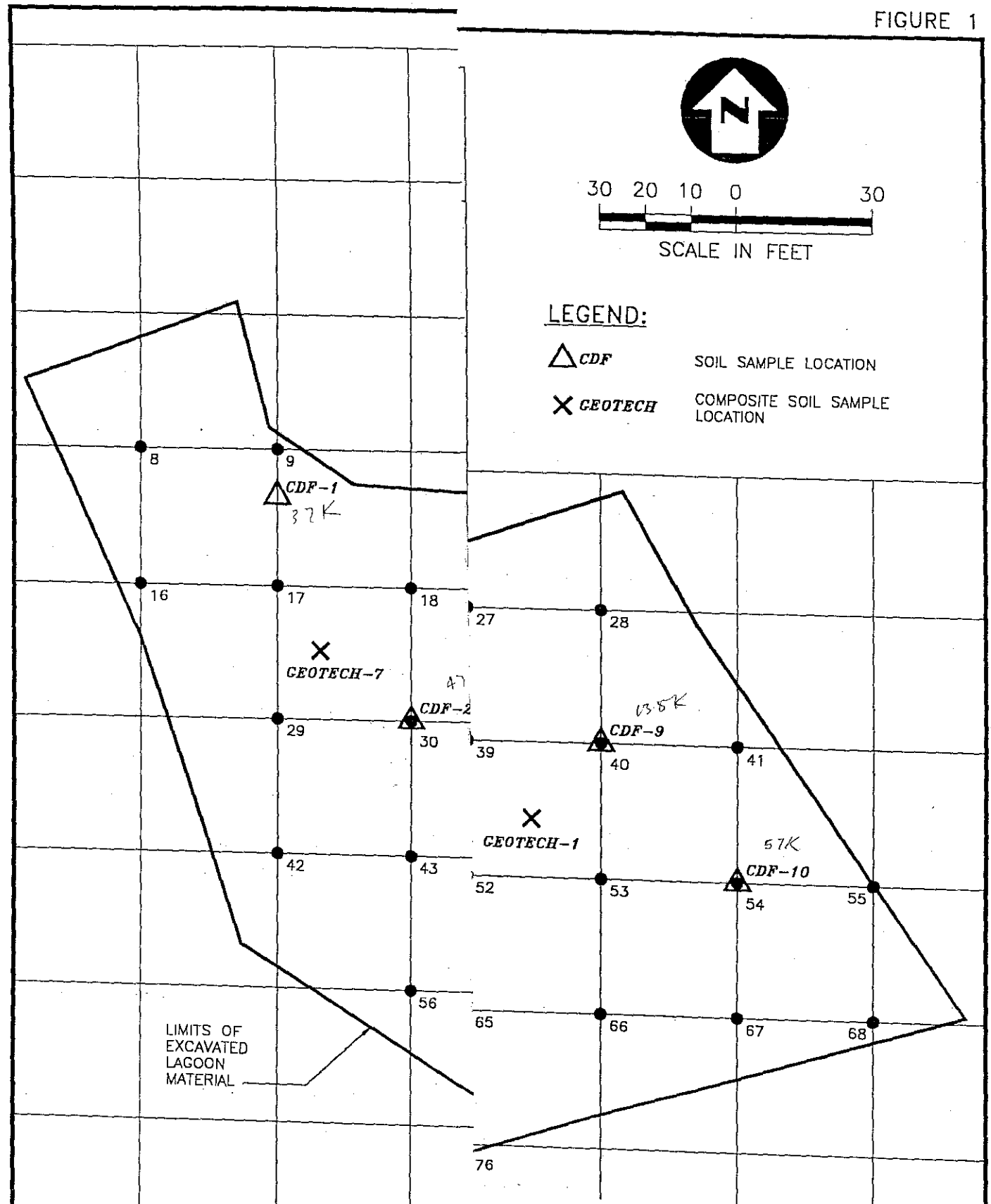
- about 3000 cubic yards of oily soil are available for stabilization in the biocell; and
- about 600 cubic yards of clay will be required for the upper and lower layers lining the re-constructed Lagoon #1.

Table 4 contains the cost estimate, provided by major cost category.

Preliminary Schedule

It is projected that this recommended option, for re-constructing Lagoon #1 and addressing the disposition of the biocell material concurrently, can be accomplished within 9 to 10 weeks after CDF's issuance of an order to proceed. In particular, the final design for Lagoon #1 can be completed within 3-4 weeks. The construction phase of the project is anticipated to require about six (6) weeks.

FIGURE 1



OIL SAMPLING LOCATIONS

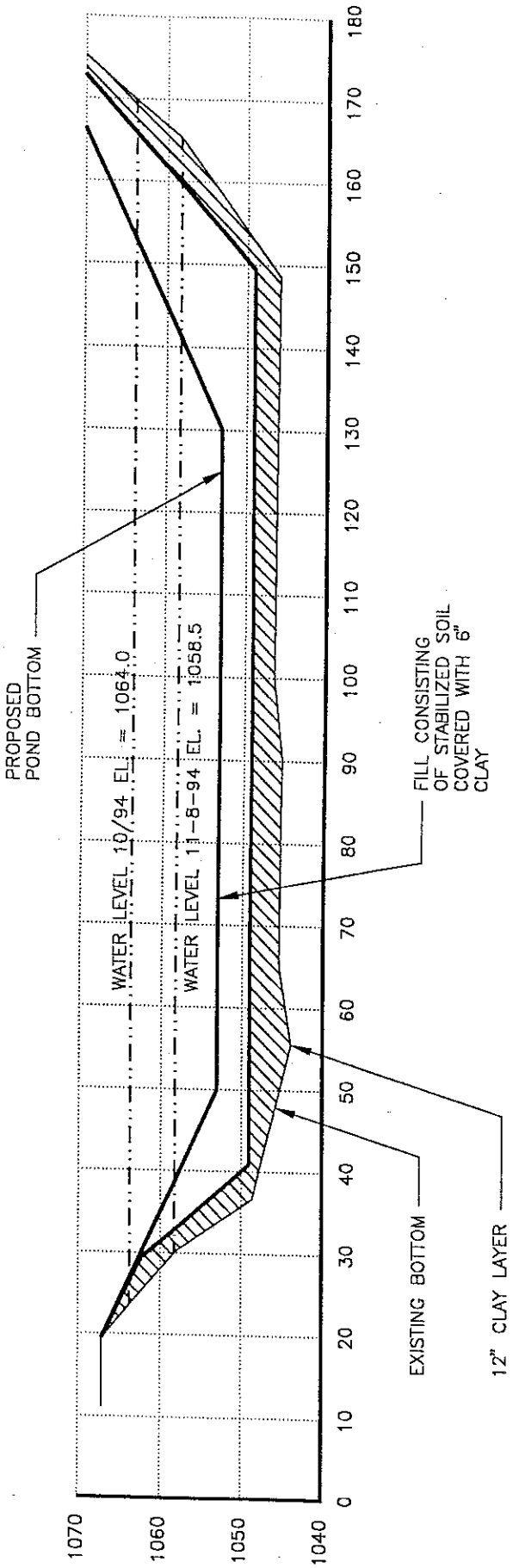
CANTON DROP FORGE

4575 SOUTHWAY STREET
CANTON, OHIO

CDF001694

31397C01

731397



LAGOON CROSS SECTION

31397C02

TABLE 1

ANALYTICAL PROCEDURES - SOIL
CANTON DROP FORGE
4575 SOUTHWAY STREET
CANTON, OHIO

18 April 1997

Analyte	Method
Total Petroleum Hydrocarbons - Middle Range Organics	EPA Method SW846-8015A (modified)
Total Petroleum Hydrocarbons - Heavy Range Organics	EPA Method SW846-8015A (modified)
Total Petroleum Hydrocarbons	EPA Method 418.1
Semi-Volatile Organic Compounds	EPA Method SW846-8270B

TABLE 2

RESULTS OF LABORATORY ANALYSIS - SOIL
CANTON DROP FORGE
4575 SOUTHWAY STREET
CANTON, OHIO

18 April 1997

Sample ID	Middle Range Organics (ppm)	Heavy Range Organics (ppm)	TPH-418.1 (ppm)	Pyrene (ppm)	Chrysene (ppm)
CDF-1	19.0	671	36,900	<20	<20
CDF-2	42.3	893	46,900	<20	<20
CDF-3	94.8	1,620	92,600	<20	<20
CDF-4	59.4	593	72,700	<20	<20
CDF-5	118	1,090	104,000	<20	<20
CDF-6	101	1,080	89,600	<20	<20
CDF-7	101	1,170	93,800	25.2	22.5
CDF-8	147	1,270	95,000	20.5	25.8
CDF-9	196	1,100	135,000	22.5	22.1
CDF-10	32.6	580	57,200	<20	<20
VAP Limits for Industrial Use Properties	20,000	40,000	NA	8,900	3,100

NA - Not applicable.

TABLE 3
CANTON DROP FORGE, INC. PLANT, CANTON, OHIO
LAGOON #1 RE-CONSTRUCTION / BIOCELL DISPOSITION OPTIONS

Indicator	Description of Options	Subjective Evaluation (1-5, with 5= best)					
		Economic Impact[1]	Scheduling Impact[2]	Technical Feasibility[3]	Stakeholder Acceptance[4]	Permitting Req'ments[5]	Overall Rating
A	Disposal in off-site landfill[6]	3	5	4	3	3	18
B	Stabilization in on-site parking area[6] (to be covered with asphalt)	2	4	4	3	4	17
C	Stabilization in on-site track or roadway area[6] (not covered)	2	4	3	2	5	16
D	Transport to Ashland's Canton Refinery for feed-stock[6]	3	2	1	3	3	12
E	Transport to asphalt plant for feed-stock[6]	4	2	3	3	3	15
F	Stabilization and use in conjunction with clay layers[6]	4	4	4	4	5	21

Notes:

1) Economic Impact = 1 for options ≥ $50/tn and = 5 for options ≤ $10/tn.
2) Scheduling Impact = 1 for options ≥ 8 months and = 5 for options ≤ 2 months.
3) Technical Feasibility = 1 for impractical / very difficult options and = 5 for easily implemented options.
4) Stakeholder Acceptance = 1 for options meeting substantial / insurmountable objections and = 5 for fully acceptable options.
5) Permitting Requirements = 1 for substantial / difficult requirements and = 5 for no permits required.
6) Options A-F include transport, placement and compaction of clean fill in Lagoon #1.

TABLE 3
CANTON DROP FORGE, INC. PLANT, CANTON, OHIO
LAGOON #1 RE-CONSTRUCTION / BIOCELL DISPOSITION OPTIONS

Indicator	Description of Options	Subjective Evaluation (1-5, with 5= best)					
		Economic Impact[1]	Scheduling Impact[2]	Technical Feasibility[3]	Stakeholder Acceptance[4]	Permitting Req'ments[5]	Overall Rating
A	Disposal in off-site landfill[6] (AS OF 5/15 DISPOSAL $)	3 1	4	4	3	3	17 15
B	Stabilization in on-site parking area[6] (to be covered with asphalt)	2	4	4	3	5	18
C	Stabilization in on-site track or roadway area[6] (not covered)	2	4	3	2	5	16
D	Transport to Ashland's Canton Refinery for feed-stock[6]	3	2	1	3	3	12
E	Transport to asphalt plant for feed-stock[6]	4	2	3	3	3	15
F	Stabilization and use in conjunction with clay layers[6]	3	4	4	4	5	20

CDF001699

Notes:

1) Economic Impact = 1 for options ≥ $50/tn and = 5 for options ≤ $10/tn.
2) Scheduling Impact = 1 for options ≥ 8 months and = 5 for options ≤ 2 months.
3) Technical Feasibility = 1 for impractical / very difficult options and = 5 for easily implemented options.
4) Stakeholder Acceptance = 1 for options meeting substantial / insurmountable objections and = 5 for fully acceptable options.
5) Permitting Requirements = 1 for substantial / difficult requirements and = 5 for no permits required.
6) Options A-E include transport, placement and compaction of clean fill in Lagoon #1.

NOW EACH IS EQUALLY IMPORTANT SO CAN CHANGE VALUE

A & F HAVE = FINANCIAL IMPACTS

TABLE 4

BUDGETARY COST ESTIMATES (+/- 15%)
CANTON DROP FORGE, INC.
RECONSTRUCTION OF LAGOON #1 AND BIOCELL DISPOSITION

Task Description	Recommended Option Cost Estimate[1]	Off-Site Landfill Option Cost Estimate[2]
Conduct detailed design and construction review	$15,000	$7,000
Pump out Lagoon #1	$1,000	$1,000
Remove oily soil from Lagoon #1 (600 cy)	$12,000	$12,000
Re-grade Lagoon #1	$2,000	$2,000
Place and compact clay lining in Lagoon #1 (400 cy)	$14,000	$14,000
Stabilize oily soil material in the biocell (3,600 cy)	$36,000	--
Place and compact stabilized soil in Lagoon #1 (4,300 cy)	$43,000	--
Place and compact final clay layer (200 cy)	$7,000	$7,000
General conditions	$9,000	$5,000
Test, load, haul and dispose oily soil offsite (3,600 cy)	--	$117,000
Place and compact clean fill in Lagoon #1 (2,400 cy)	--	$ 24,000
TOTAL	**$139,000**	**$189,000**

Note: [1] Assumes that stabilized biocell material and clay liners, when compacted and placed, will provide sufficient capacity in Lagoon #1 for intended stormwater impoundment. Must be verified through survey (i.e., as part of general conditions).

[2] Assumes that biocell material can be disposed at American Landfill in Waynesburg without any pretreatment required (i.e., for stabilization, de-liquification, etc.).

TABLE 4

BUDGETARY COST ESTIMATE
CANTON DROP FORGE, INC.
RECONSTRUCTION OF LAGOON #1 AND BIOCELL DISPOSITION

Task Description	Cost Estimate
Conduct detailed design and construction review	$15,000
Pump out Lagoon #1	1,000
Remove oily soil from Lagoon #1	2,000
Re-grade Lagoon #1	2,000
Place and compact clay lining in Lagoon #1	10,000
Stabilize oily soil material in the biocell	75,000
Place and compact stabilized soil in Lagoon #1	30,000
Place and compact final clay layer	5,000
General conditions	10,000
TOTAL	**$150,000**

$40/cu yd 2,500 cu yds

± 30%

$150,000 FOR

American Landfill, Inc.

An American Waste Services Company

2(6)

One American Way • Warren, OH 44484-5555 • Phone: (330) 856-8800 • Fax: (330) 856-8483

May 15, 1997

Via Facsimile #216-486-6119

Mr. Rick Volpi
Parsons Engineering Science
19101 Villaview Road, Suite 301
Cleveland, Ohio 44119

RE: Transportation and Disposal of TPH Contaminated Soil
American Waste Services I.D. #21707-1

Dear Mr. Volpi:

American Landfill, Inc. is pleased to quote pricing for transportation and disposal of TPH Contaminated Soils (non-hazardous) from your project in Canton, OH (Stark County). Pricing is as follows:

Transportation & Disposal: $20.50 per ton, which includes current Ohio disposal fees.
Transportation provided by Envirco Transportation Management, Inc. (#29859)

1) Material deemed to contain liquids may incur additional charges.
2) Liner is included.
3) 22 ton minimum per truck.
4) Demurrage Fee: Two hours free at each end and $60.00 per hour thereafter
5) Failure to load scheduled trucks may result in "no load" charges.
6) Five rounds per truck per day.

The above pricing is based on the information supplied and also subject to approval of this waste at American Landfill, Inc. These prices are valid for thirty (30) days from date of this letter.

Invoicing and taxes will be based upon weight tickets generated by certified scales. Payment for services performed shall be made within fifteen (15) days of receipt of invoice.

Parsons Engineering Service will be responsible for all applicable sales taxes, waste disposal taxes, and transportation taxes other than those included above. Any increase in taxes will be passed on to Parsons Engineering Service.

If you have any questions, please do not hesitate to contact me at (330) 856-8800. I look forward to servicing your disposal needs.

Sincerely,

Robert Lehman

Robert A. Lehman
Territory Sales Manager

RAL:jh:ALL21707

CDF001702

AMERICAN WASTE SERVICES, INC.
One American Way • Warren, Ohio 44484-5555
PHONE (330) 856-8800
FAX (330) 856-8480

260

Date: May 15, 1997

To: Rick Volpi

Company: Parsons Engineering Science

FAX No.: (216) 486-6119

From: Bob Lehman

Company: American Waste Services, Inc.

Message: Transportation & Disposal of TPH Contaminated Soil
Original will follow.

Total number of pages: 2 (including this cover page).

APPENDIX A:

RESULTS OF ENVIRONMENTAL ANALYSES FROM GEOANALYTICAL, INC.

FOR

CANTON DROP FORGE, INC.
CANTON, OHIO

APRIL/MAY 1997

G E O Analytical, Inc.

2(6)

Report Issued To: Parsons Engineering Science
19101 Villaview Road, Suite 300
Cleveland, Ohio 44119

GEO Job# 9704102(A) Project Number: 731397.01000
Matrix Type: Soil
Samples Received: 04/22/97 Project Name: Canton Drop Forge
Date Analyzed: 04/25-26/97
Analysis Reported: 04/29/97

NONHALOGENATED VOLATILE ORGANICS IN SOIL

Lab #	Date	Station Location	Middle Range Organics	Heavy Range Organics	Reporting Limit
1995	04/18/97	CDF-1	19.0	671	4.0
1996	04/18/97	CDF-2	42.3	893	4.0
1997	04/18/97	CDF-3	94.8	1,620	4.0
1998	04/18/97	CDF-4	59.4	593	4.0
1999	04/18/97	CDF-5	118	1,090	4.0
2000	04/18/97	CDF-6	101	1,080	4.0
2001	04/18/97	CDF-7	101	1,170	4.0
2002	04/18/97	CDF-8	147	1,270	4.0
2003	04/18/97	CDF-9	196	1,100	4.0
2004	04/18/97	CDF-10	32.6	580	4.0
			mg/Kg	mg/Kg	mg/Kg

Analytical Methodology Information

EPA Method SW846-8015A(Modified), "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods"

Middle Range Organics calculated from Heptane (C7) to Hexadecane (C16).

Heavy Range Organics calculated from Hexadecane (C16) to Dotriacontane (C32).

Samples may contain compounds with higher molecular weights than Dotriacontane (C32) which are not calculated in the Total Petroleum Hydrocarbons number reported.

These petroleum fractions are found in Rule 3746 of the OAC Section 3745-300-08 of the Generic Numeric Standards.

Initial Calibration Date: 05/20/96-01/09/97
Continuing Calibration Date: 04/25-26/97
Analyst: M. Darsot - C. Lang

ANALYSIS REVIEWED AND APPROVED BY Christa Thaxton

CDF001705

GEO Analytical, Inc.

Report Issued To: Parsons Engineering Science
19101 Villaview Road, Suite 300
Cleveland, Ohio 44119

GEO Job# 9704102(B)
Matrix Type: Soil
Samples Received: 04/22/97
Date Analyzed: 04/25-28/97
Analysis Reported: 04/29/97

Project Number: 731397.01000
Project Name: Canton Drop Forge

PETROLEUM HYDROCARBONS, TOTAL RECOVERABLE IN SOIL

Lab #	Date	Station Location	Result	Reporting Limit
1995	04/18/97	CDF-1	36,900	2,000
1996	04/18/97	CDF-2	46,900	4,000
1997	04/18/97	CDF-3	92,600	4,000
1998	04/18/97	CDF-4	72,700	2,000
1999	04/18/97	CDF-5	104,000	4,000
2000	04/18/97	CDF-6	89,600	4,000
2001	04/18/97	CDF-7	93,800	4,000
2002	04/18/97	CDF-8	95,000	4,000
2003	04/18/97	CDF-9	135,000	2,000
2004	04/18/97	CDF-10	57,200	2,000
			mg/Kg	mg/Kg

Analytical Methodology Information

EPA Method 418.1, "Methods for Chemical Analysis of Water and Wastes"

Initial Calibration Date: 04/25-28/97
Continuing Calibration Date: 04/25-28/97
Analyst: J. Woodall

ANALYSIS REVIEWED AND APPROVED BY Christie Paxton

CDF001706

9263 Ravenna Rd. • Suite A-7 • Twinsburg, Ohio 44087 • Phone 216 963 0990 • Fax 216 963 6975

G E O A n a l y t i c a l , I n c .

Report Issued To: Parsons Engineering Science
19101 Villaview Road, Suite 300
Cleveland, Ohio 44119

GEO Job#: 9704102(M)-2005
Matrix Type: Water
Samples Received: 04/22/97
Date Analyzed: 04/23/97
Analysis Reported: 04/24/97

Project Number: 731397.01000
Project Name: Canton Drop Forge

Sample Date: 04/18/97
Sample Description: Trip Blank

GAS CHROMATOGRAPHY/MASS SPECTROMETRY FOR SEMI-VOLATILE ORGANICS IN WATER

COMPOUNDS	RESULTS	REPORTING LIMIT
N-Nitrosodimethylamine	< 25.0	25.0
Phenol	< 5.0	5.0
2-Chlorophenol	< 5.0	5.0
bis(2-Chloroethyl)ether	< 5.0	5.0
1,3-Dichlorobenzene	< 5.0	5.0
1,4-Dichlorobenzene	< 5.0	5.0
1,2-Dichlorobenzene	< 5.0	5.0
2-Methylphenol	< 5.0	5.0
bis(2-Chloroisopropyl)ether	< 5.0	5.0
4-Methylphenol	< 5.0	5.0
Hexachloroethane	< 5.0	5.0
N-Nitroso-di-n-propylamine	< 25.0	25.0
Nitrobenzene	< 5.0	5.0
Isophorone	< 5.0	5.0
2-Nitrophenol	< 5.0	5.0
2,4-Dimethylphenol	< 5.0	5.0
bis(2-Chloroethoxy)methane	< 5.0	5.0
2,4-Dichlorophenol	< 5.0	5.0
1,2,4-Trichlorobenzene	< 5.0	5.0
Naphthalene	< 5.0	5.0
4-Chloroanaline	< 5.0	5.0
Hexachlorobutadiene	< 5.0	5.0
4-Chloro-3-methylphenol	< 5.0	5.0
2-Methylnaphthalene	< 5.0	5.0
Hexachlorocyclopentadiene	< 5.0	5.0
2,4,5-Trichlorophenol	< 5.0	5.0
2,4,6-Trichlorophenol	< 5.0	5.0
2-Chloronaphthalene	< 5.0	5.0
2-Nitroanaline	< 5.0	5.0
Acenaphthylene	< 5.0	5.0
Dimethyl phthalate	< 5.0	5.0
2,6-Dinitrotoluene	< 5.0	5.0
3-Nitroanaline	< 5.0	5.0
Acenaphthene	< 5.0	5.0
2,4-Dinitrophenol	< 25.0	25.0
4-Nitrophenol	< 5.0	5.0
Dibenzofuran	< 5.0	5.0
2,4-Dinitrotoluene	< 5.0	5.0
	ug/L	ug/L

CDF001707

G. E O Analytical, Inc.

GEO Job# :9704102(M)-2005
Page 2 of 2

COMPOUNDS	RESULTS	REPORTING LIMIT
Diethyl phthalate	< 5.0	5.0
Fluorene	< 5.0	5.0
4-Chlorophenylphenyl ether	< 5.0	5.0
4-Nitroanaline	< 5.0	5.0
2-Methyl-4,6-dinitrophenol	< 25.0	25.0
N-Nitrosodiphenylamine	< 5.0	5.0
4-Bromphenylphenyl ether	< 5.0	5.0
Hexachlorobenzene	< 5.0	5.0
Pentachlorophenol	< 5.0	5.0
Phenanthrene	< 5.0	5.0
Anthracene	< 5.0	5.0
Carbazole	< 5.0	5.0
Di-n-butyl phthalate	< 5.0	5.0
Fluoranthene	< 5.0	5.0
Pyrene	< 5.0	5.0
Butyl benzyl phthalate	< 5.0	5.0
Benzo(a)anthracene	< 5.0	5.0
3,3'-Dichlorobenzidine	< 25.0	25.0
Chrysene	< 5.0	5.0
bis(2-Ethylhexyl) phthalate	< 5.0	5.0
Di-n-octyl phthalate	< 5.0	5.0
Benzo(b)fluoranthene	< 5.0	5.0
Benzo(k)fluoranthene	< 5.0	5.0
Benzo(a)pyrene	< 2.0	2.0
Indeno(1,2,3-cd)pyrene	< 5.0	5.0
Dibenzo(a,h)anthracene	< 5.0	5.0
Benzo(ghi)perylene	< 5.0	5.0
	ug/L	ug/L

COMPOUND	% SURROGATE RECOVERY	ACCEPTABLE RANGE
2-Fluorophenol	50	35-110
Phenol d5	27	10 -110
Nitrobenzene d5	68	35 -114
2-Fluorobiphenyl	72	43 -116
2,4,6-Tribromophenol	89	10 -123
Terphenyl d14	72	33 -141

* indicates surrogate recovery outside of acceptable range.

Analytical Methodology Information

EPA Method SW846-8270B, "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods"

Initial Calibration Date: 04/17/97
Continuing Calibration Date: 04/23/97
Analyst: T. Lang

ANALYSIS REVIEWED AND APPROVED BY Christie Thaxton

CDF001708

G E O Analytical, Inc.

Report Issued To: Parsons Engineering Science
19101 Villaview Road, Suite 300
Cleveland, Ohio 44119

GEO Job#	9704102(C)-1995	Project Number:	731397.01000
Matrix Type:	Soil		
Samples Received:	04/22/97	Project Name:	Canton Drop Forge
Date Analyzed:	04/30-05/02/97		
Analysis Reported:	05/06/97		

Sample Date: 04/18/97
Sample Description: CDF-1

GAS CHROMATOGRAPHY/MASS SPECTROMETRY FOR SEMI-VOLATILE ORGANICS IN SOIL

COMPOUNDS	RESULTS	REPORTING LIMIT
N-Nitrosodimethylamine	< 100	100
Phenol	< 20.0	20.0
2-Chlorophenol	< 20.0	20.0
bis(2-Chloroethyl)ether	< 20.0	20.0
1,3-Dichlorobenzene	< 20.0	20.0
1,4-Dichlorobenzene	< 20.0	20.0
1,2-Dichlorobenzene	< 20.0	20.0
2-Methylphenol	< 20.0	20.0
bis(2-Chloroisopropyl)ether	< 20.0	20.0
4-Methylphenol	< 20.0	20.0
Hexachloroethane	< 20.0	20.0
N-Nitroso-di-n-propylamine	< 100	100
Nitrobenzene	< 20.0	20.0
Isophorone	< 20.0	20.0
2-Nitrophenol	< 20.0	20.0
2,4-Dimethylphenol	< 20.0	20.0
bis(2-Chloroethoxy)methane	< 20.0	20.0
2,4-Dichlorophenol	< 20.0	20.0
1,2,4-Trichlorobenzene	< 20.0	20.0
Naphthalene	< 20.0	20.0
4-Chloroanaline	< 20.0	20.0
Hexachlorobutadiene	< 20.0	20.0
4-Chloro-3-methylphenol	< 20.0	20.0
2-Methylnaphthalene	< 20.0	20.0
Hexachlorocyclopentadiene	< 20.0	20.0
2,4,5-Trichlorophenol	< 20.0	20.0
2,4,6-Trichlorophenol	< 20.0	20.0
2-Chloronaphthalene	< 20.0	20.0
2-Nitroanaline	< 20.0	20.0
Acenaphthylene	< 20.0	20.0
Dimethyl phthalate	< 20.0	20.0
2,6-Dinitrotoluene	< 20.0	20.0
3-Nitroanaline	< 20.0	20.0
Acenaphthene	< 20.0	20.0
2,4-Dinitrophenol	< 100	100
4-Nitrophenol	< 20.0	20.0
Dibenzofuran	< 20.0	20.0
2,4-Dinitrotoluene	< 20.0	20.0
	mg/Kg	mg/Kg

CDF001709

G E O Analytical Inc.

Report Issued To: Parsons Engineering Science
19101 Villaview Road, Suite 300
Cleveland, Ohio 44119

GEO Job#: 9704102(D)-1996
Matrix Type: Soil
Samples Received: 04/22/97
Date Analyzed: 04/30-05/02/97
Analysis Reported: 05/06/97

Project Number: 731397.01000
Project Name: Canton Drop Forge

Sample Date: 04/18/97
Sample Description: CDF-2

GAS CHROMATOGRAPHY/MASS SPECTROMETRY FOR SEMI-VOLATILE ORGANICS IN SOIL

COMPOUNDS	RESULTS	REPORTING LIMIT
N-Nitrosodimethylamine	< 100	100
Phenol	< 20.0	20.0
2-Chlorophenol	< 20.0	20.0
bis(2-Chloroethyl)ether	< 20.0	20.0
1,3-Dichlorobenzene	< 20.0	20.0
1,4-Dichlorobenzene	< 20.0	20.0
1,2-Dichlorobenzene	< 20.0	20.0
2-Methylphenol	< 20.0	20.0
bis(2-Chloroisopropyl)ether	< 20.0	20.0
4-Methylphenol	< 20.0	20.0
Hexachloroethane	< 20.0	20.0
N-Nitroso-di-n-propylamine	< 100	100
Nitrobenzene	< 20.0	20.0
Isophorone	< 20.0	20.0
2-Nitrophenol	< 20.0	20.0
2,4-Dimethylphenol	< 20.0	20.0
bis(2-Chloroethoxy)methane	< 20.0	20.0
2,4-Dichlorophenol	< 20.0	20.0
1,2,4-Trichlorobenzene	< 20.0	20.0
Naphthalene	< 20.0	20.0
4-Chloroanaline	< 20.0	20.0
Hexachlorobutadiene	< 20.0	20.0
4-Chloro-3-methylphenol	< 20.0	20.0
2-Methylnaphthalene	< 20.0	20.0
Hexachlorocyclopentadiene	< 20.0	20.0
2,4,5-Trichlorophenol	< 20.0	20.0
2,4,6-Trichlorophenol	< 20.0	20.0
2-Chloronaphthalene	< 20.0	20.0
2-Nitroanaline	< 20.0	20.0
Acenaphthylene	< 20.0	20.0
Dimethyl phthalate	< 20.0	20.0
2,6-Dinitrotoluene	< 20.0	20.0
3-Nitroanaline	< 20.0	20.0
Acenaphthene	< 20.0	20.0
2,4-Dinitrophenol	< 100	100
4-Nitrophenol	< 20.0	20.0
Dibenzofuran	< 20.0	20.0
2,4-Dinitrotoluene	< 20.0	20.0
	mg/Kg	mg/Kg

CDF001710

G E O . A n a l y t i c a l , I n c .

GEO Job# 9704102(D)-1996
Page 2 of 2

COMPOUNDS	RESULTS	REPORTING LIMIT
Diethyl phthalate	< 20.0	20.0
Fluorene	< 20.0	20.0
4-Chlorophenylphenyl ether	< 20.0	20.0
4-Nitroaniline	< 20.0	20.0
2-Methyl-4,6-dinitrophenol	< 100	100
N-Nitrosodiphenylamine	< 20.0	20.0
4-Bromphenylphenyl ether	< 20.0	20.0
Hexachlorobenzene	< 20.0	20.0
Pentachlorophenol	< 20.0	20.0
Phenanthrene	< 20.0	20.0
Anthracene	< 20.0	20.0
Carbazole	< 20.0	20.0
Di-n-butyl phthalate	< 20.0	20.0
Fluoranthene	< 20.0	20.0
Pyrene	< 20.0	20.0
Butyl benzyl phthalate	< 20.0	20.0
Benzo(a)anthracene	< 20.0	20.0
3,3'-Dichlorobenzidine	< 100	100
Chrysene	< 20.0	20.0
bis(2-Ethylhexyl) phthalate	< 20.0	20.0
Di-n-octyl phthalate	< 20.0	20.0
Benzo(b)fluoranthene	< 20.0	20.0
Benzo(k)fluoranthene	< 20.0	20.0
Benzo(a)pyrene	< 20.0	20.0
Indeno(1,2,3-cd)pyrene	< 20.0	20.0
Dibenzo(a,h)anthracene	< 20.0	20.0
Benzo(ghi)perylene	< 20.0	20.0
	mg/Kg	mg/Kg

COMPOUND	% SURROGATE RECOVERY	ACCEPTABLE RANGE
2-Fluorophenol	92	33 - 144
Phenol d5	82	62 - 120
Nitrobenzene d5	102	80 - 132
2-Fluorobiphenyl	69	67 - 105
2,4,6-Tribromophenol	95	24 - 135
Terphenyl d14	94	49 - 141

* Indicates surrogate recovery outside of acceptable range.

Analytical Methodology Information

EPA Method SW846-8270B, "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods"

Initial Calibration Date: 04/17/97-05/01/97
Continuing Calibration Date: 04/30-05/02/97
Analyst: T. Lang

REVIEWED AND APPROVED BY Christa Thomas

CDF001711

G E O Analytical, Inc.

Report Issued To: Parsons Engineering Science
19101 Villaview Road, Suite 300
Cleveland, Ohio 44119

GEO Job#: 9704102(E)-1997
Matrix Type: Soil
Samples Received: 04/22/97
Date Analyzed: 04/30-05/02/97
Analysis Reported: 05/06/97

Project Number: 731397.01000
Project Name: Canton Drop Forge

Sample Date: 04/18/97
Sample Description: CDF-3

GAS CHROMATOGRAPHY/MASS SPECTROMETRY FOR SEMI-VOLATILE ORGANICS IN SOIL

COMPOUNDS	RESULTS	REPORTING LIMIT
N-Nitrosodimethylamine	< 100	100
Phenol	< 20.0	20.0
2-Chlorophenol	< 20.0	20.0
bis(2-Chloroethyl)ether	< 20.0	20.0
1,3-Dichlorobenzene	< 20.0	20.0
1,4-Dichlorobenzene	< 20.0	20.0
1,2-Dichlorobenzene	< 20.0	20.0
2-Methylphenol	< 20.0	20.0
bis(2-Chloroisopropyl)ether	< 20.0	20.0
4-Methylphenol	< 20.0	20.0
Hexachloroethane	< 20.0	20.0
N-Nitroso-di-n-propylamine	< 100	100
Nitrobenzene	< 20.0	20.0
Isophorone	< 20.0	20.0
2-Nitrophenol	< 20.0	20.0
2,4-Dimethylphenol	< 20.0	20.0
bis(2-Chloroethoxy)methane	< 20.0	20.0
2,4-Dichlorophenol	< 20.0	20.0
1,2,4-Trichlorobenzene	< 20.0	20.0
Naphthalene	< 20.0	20.0
4-Chloroanaline	< 20.0	20.0
Hexachlorobutadiene	< 20.0	20.0
4-Chloro-3-methylphenol	< 20.0	20.0
2-Methylnaphthalene	< 20.0	20.0
Hexachlorocyclopentadiene	< 20.0	20.0
2,4,5-Trichlorophenol	< 20.0	20.0
2,4,6-Trichlorophenol	< 20.0	20.0
2-Chloronaphthalene	< 20.0	20.0
2-Nitroanaline	< 20.0	20.0
Acenaphthylene	< 20.0	20.0
Dimethyl phthalate	< 20.0	20.0
2,6-Dinitrotoluene	< 20.0	20.0
3-Nitroanaline	< 20.0	20.0
Acenaphthene	< 20.0	20.0
2,4-Dinitrophenol	< 100	100
4-Nitrophenol	< 20.0	20.0
Dibenzofuran	< 20.0	20.0
2,4-Dinitrotoluene	< 20.0	20.0
	mg/Kg	mg/Kg

CDF001712

G E O A n a l y t i c a l , I n c .

GEO Job# 9704102(E)-1997
Page 2 of 2

COMPOUNDS	RESULTS	REPORTING LIMIT
Diethyl phthalate	< 20.0	20.0
Fluorene	< 20.0	20.0
4-Chlorophenylphenyl ether	< 20.0	20.0
4-Nitroanaline	< 20.0	20.0
2-Methyl-4,6-dinitrophenol	< 100	100
N-Nitrosodiphenylamine	< 20.0	20.0
4-Bromphenylphenyl ether	< 20.0	20.0
Hexachlorobenzene	< 20.0	20.0
Pentachlorophenol	< 20.0	20.0
Phenanthrene	< 20.0	20.0
Anthracene	< 20.0	20.0
Carbazole	< 20.0	20.0
Di-n-butyl phthalate	< 20.0	20.0
Fluoranthene	< 20.0	20.0
Pyrene	< 20.0	20.0
Butyl benzyl phthalate	< 20.0	20.0
Benzo(a)anthracene	< 20.0	20.0
3,3'-Dichlorobenzidine	< 100	100
Chrysene	< 20.0	20.0
bis(2-Ethylhexyl) phthalate	< 20.0	20.0
Di-n-octyl phthalate	< 20.0	20.0
Benzo(b)fluoranthene	< 20.0	20.0
Benzo(k)fluoranthene	< 20.0	20.0
Benzo(a)pyrene	< 20.0	20.0
Indeno(1,2,3-cd)pyrene	< 20.0	20.0
Dibenzo(a,h)anthracene	< 20.0	20.0
Benzo(ghi)perylene	< 20.0	20.0
	mg/Kg	mg/Kg

COMPOUND	% SURROGATE RECOVERY	ACCEPTABLE RANGE
2-Fluorophenol	88	33 - 144
Phenol d5	78	62 - 120
Nitrobenzene d5	93	80 - 132
2-Fluorobiphenyl	74	67 - 105
2,4,6-Tribromophenol	101	24 - 135
Terphenyl d14	80	49 - 141

* Indicates surrogate recovery outside of acceptable range.

Analytical Methodology Information

EPA Method SW846-8270B, "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods"

Initial Calibration Date: 04/17/97-05/01/97
Continuing Calibration Date: 04/30-05/02/97.
Analyst: T. Lang

REVIEWED AND APPROVED BY Christie Thomas

CDF001713

G E O Analytical, Inc.

Report Issued To: Parsons Engineering Science
19101 Villaview Road, Suite 300
Cleveland, Ohio 44119

GEO Job#: 9704102(F)-1998
Matrix Type: Soil
Samples Received: 04/22/97
Date Analyzed: 04/30-05/02/97
Analysis Reported: 05/06/97

Project Number: 731397.01000
Project Name: Canton Drop Forge

Sample Date: 04/18/97
Sample Description: CDF-4

GAS CHROMATOGRAPHY/MASS SPECTROMETRY FOR SEMI-VOLATILE ORGANICS IN SOIL

COMPOUNDS	RESULTS	REPORTING LIMIT
N-Nitrosodimethylamine	< 100	100
Phenol	< 20.0	20.0
2-Chlorophenol	< 20.0	20.0
bis(2-Chloroethyl)ether	< 20.0	20.0
1,3-Dichlorobenzene	< 20.0	20.0
1,4-Dichlorobenzene	< 20.0	20.0
1,2-Dichlorobenzene	< 20.0	20.0
2-Methylphenol	< 20.0	20.0
bis(2-Chloroisopropyl)ether	< 20.0	20.0
4-Methylphenol	< 20.0	20.0
Hexachloroethane	< 20.0	20.0
N-Nitroso-di-n-propylamine	< 100	100
Nitrobenzene	< 20.0	20.0
Isophorone	< 20.0	20.0
2-Nitrophenol	< 20.0	20.0
2,4-Dimethylphenol	< 20.0	20.0
bis(2-Chloroethoxy)methane	< 20.0	20.0
2,4-Dichlorophenol	< 20.0	20.0
1,2,4-Trichlorobenzene	< 20.0	20.0
Naphthalene	< 20.0	20.0
4-Chloroanaline	< 20.0	20.0
Hexachlorobutadiene	< 20.0	20.0
4-Chloro-3-methylphenol	< 20.0	20.0
2-Methylnaphthalene	< 20.0	20.0
Hexachlorocyclopentadiene	< 20.0	20.0
2,4,5-Trichlorophenol	< 20.0	20.0
2,4,6-Trichlorophenol	< 20.0	20.0
2-Chloronaphthalene	< 20.0	20.0
2-Nitroanaline	< 20.0	20.0
Acenaphthylene	< 20.0	20.0
Dimethyl phthalate	< 20.0	20.0
2,6-Dinitrotoluene	< 20.0	20.0
3-Nitroanaline	< 20.0	20.0
Acenaphthene	< 20.0	20.0
2,4-Dinitrophenol	< 100	100
4-Nitrophenol	< 20.0	20.0
Dibenzofuran	< 20.0	20.0
2,4-Dinitrotoluene	< 20.0	20.0
	mg/Kg	mg/Kg

CDF001714

G E O A n a l y t i c a l, I n c.

GEO Job# 9704102(F)-1998

COMPOUNDS	RESULTS	REPORTING LIMIT
Diethyl phthalate	< 20.0	20.0
Fluorene	< 20.0	20.0
4-Chlorophenylphenyl ether	< 20.0	20.0
4-Nitroaniline	< 20.0	20.0
2-Methyl-4,6-dinitrophenol	< 100	100
N-Nitrosodiphenylamine	< 20.0	20.0
4-Bromphenylphenyl ether	< 20.0	20.0
Hexachlorobenzene	< 20.0	20.0
Pentachlorophenol	< 20.0	20.0
Phenanthrene	< 20.0	20.0
Anthracene	< 20.0	20.0
Carbazole	< 20.0	20.0
Di-n-butyl phthalate	< 20.0	20.0
Fluoranthene	< 20.0	20.0
Pyrene	< 20.0	20.0
Butyl benzyl phthalate	< 20.0	20.0
Benzo(a)anthracene	< 20.0	20.0
3,3'-Dichlorobenzidine	< 100	100
Chrysene	< 20.0	20.0
bis(2-Ethylhexyl) phthalate	< 20.0	20.0
Di-n-octyl phthalate	< 20.0	20.0
Benzo(b)fluoranthene	< 20.0	20.0
Benzo(k)fluoranthene	< 20.0	20.0
Benzo(a)pyrene	< 20.0	20.0
Indeno(1,2,3-cd)pyrene	< 20.0	20.0
Dibenzo(a,h)anthracene	< 20.0	20.0
Benzo(ghi)perylene	< 20.0	20.0
	mg/Kg	mg/Kg

COMPOUND	% SURROGATE RECOVERY	ACCEPTABLE RANGE
2-Fluorophenol	82	33 - 144
Phenol d5	72	62 - 120
Nitrobenzene d5	86	80 - 132
2-Fluorobiphenyl	95	67 - 105
2,4,6-Tribromophenol	92	24 - 135
Terphenyl d14	79	49 - 141

* Indicates surrogate recovery outside of acceptable range.

Analytical Methodology Information

EPA Method SW846-8270B, "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods"

Initial Calibration Date: 04/17/97-05/01/97
Continuing Calibration Date: 04/30-05/02/97
Analyst: T. Lang

REVIEWED AND APPROVED BY Christi Thomas

CDF001715

G E O Analytical, Inc.

Report Issued To: Parsons Engineering Science
19101 Villaview Road, Suite 300
Cleveland, Ohio 44119.

GEO Job# 9704102(G)-1999
Matrix Type: Soil
Samples Received: 04/22/97
Date Analyzed: 04/30-05/03/97
Analysis Reported: 05/06/97

Project Number: 731397.01000
Project Name: Canton Drop Forge

Sample Date: 04/18/97
Sample Description: CDF-5

GAS CHROMATOGRAPHY/MASS SPECTROMETRY FOR SEMI-VOLATILE ORGANICS IN SOIL

COMPOUNDS	RESULTS	REPORTING LIMIT
N-Nitrosodimethylamine	< 100	100
Phenol	< 20.0	20.0
2-Chlorophenol	< 20.0	20.0
bis(2-Chloroethyl)ether	< 20.0	20.0
1,3-Dichlorobenzene	< 20.0	20.0
1,4-Dichlorobenzene	< 20.0	20.0
1,2-Dichlorobenzene	< 20.0	20.0
2-Methylphenol	< 20.0	20.0
bis(2-Chloroisopropyl)ether	< 20.0	20.0
4-Methylphenol	< 20.0	20.0
Hexachloroethane	< 20.0	20.0
N-Nitroso-di-n-propylamine	< 100	100
Nitrobenzene	< 20.0	20.0
Isophorone	< 20.0	20.0
2-Nitrophenol	< 20.0	20.0
2,4-Dimethylphenol	< 20.0	20.0
bis(2-Chloroethoxy)methane	< 20.0	20.0
2,4-Dichlorophenol	< 20.0	20.0
1,2,4-Trichlorobenzene	< 20.0	20.0
Naphthalene	< 20.0	20.0
4-Chloroanaline	< 20.0	20.0
Hexachlorobutadiene	< 20.0	20.0
4-Chloro-3-methylphenol	< 20.0	20.0
2-Methylnaphthalene	< 20.0	20.0
Hexachlorocyclopentadiene	< 20.0	20.0
2,4,5-Trichlorophenol	< 20.0	20.0
2,4,6-Trichlorophenol	< 20.0	20.0
2-Chloronaphthalene	< 20.0	20.0
2-Nitroanaline	< 20.0	20.0
Acenaphthylene	< 20.0	20.0
Dimethyl phthalate	< 20.0	20.0
2,6-Dinitrotoluene	< 20.0	20.0
3-Nitroanaline	< 20.0	20.0
Acenaphthene	< 20.0	20.0
2,4-Dinitrophenol	< 100	100
4-Nitrophenol	< 20.0	20.0
Dibenzofuran	< 20.0	20.0
2,4-Dinitrotoluene	< 20.0	20.0
	mg/Kg	mg/Kg

CDF001716

G E O A n a l y t i c a l , I n c .

GEO Job# . 9704102(G)-1999
Page 2 of 2

COMPOUNDS	RESULTS	REPORTING LIMIT
Diethyl phthalate	< 20.0	20.0
Fluorene	< 20.0	20.0
4-Chlorophenylphenyl ether	< 20.0	20.0
4-Nitroanaline	< 20.0	20.0
2-Methyl-4,6-dinitrophenol	< 100	100
N-Nitrosodiphenylamine	< 20.0	20.0
4-Bromphenylphenyl ether	< 20.0	20.0
Hexachlorobenzene	< 20.0	20.0
Pentachlorophenol	< 20.0	20.0
Phenanthrene	< 20.0	20.0
Anthracene	< 20.0	20.0
Carbazole	< 20.0	20.0
Di-n-butyl phthalate	< 20.0	20.0
Fluoranthene	< 20.0	20.0
Pyrene	< 20.0	20.0
Butyl benzyl phthalate	< 20.0	20.0
Benzo(a)anthracene	< 20.0	20.0
3,3'-Dichlorobenzidine	< 100	100
Chrysene	< 20.0	20.0
bis(2-Ethylhexyl) phthalate	< 20.0	20.0
Di-n-octyl phthalate	< 20.0	20.0
Benzo(b)fluoranthene	< 20.0	20.0
Benzo(k)fluoranthene	< 20.0	20.0
Benzo(a)pyrene	< 20.0	20.0
Indeno(1,2,3-cd)pyrene	< 20.0	20.0
Dibenzo(a,h)anthracene	< 20.0	20.0
Benzo(ghi)perylene	< 20.0	20.0
	mg/Kg	mg/Kg

COMPOUND	% SURROGATE RECOVERY	ACCEPTABLE RANGE
2-Fluorophenol	80	33 - 144
Phenol d5	71	62 - 120
Nitrobenzene d5	91	80 - 132
2-Fluorobiphenyl	101	67 - 105
2,4,6-Tribromophenol	94	24 - 135
Terphenyl d14	84	49 - 141

* Indicates surrogate recovery outside of acceptable range.

Analytical Methodology Information

EPA Method SW846-8270B, "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods"

Initial Calibration Date: 04/17/97-05/01/97
Continuing Calibration Date: 04/30-05/03/97
Analyst: T. Lang

REVIEWED AND APPROVED BY: Christa Thomm

CDF001717

G E O Analytical Inc.

Report Issued To: Parsons Engineering Science
19101 Villaview Road, Suite 300
Cleveland, Ohio 44119

GEO Job#: 9704102(H)-2000
Matrix Type: Soil
Samples Received: 04/22/97
Date Analyzed: 04/30-05/03/97
Analysis Reported: 05/06/97

Project Number: 731397.01000
Project Name: Canton Drop Forge

Sample Date: 04/16/97
Sample Description: CDF-6

GAS CHROMATOGRAPHY/MASS SPECTROMETRY FOR SEMI-VOLATILE ORGANICS IN SOIL

COMPOUNDS	RESULTS	REPORTING LIMIT
N-Nitrosodimethylamine	< 100	100
Phenol	< 20.0	20.0
2-Chlorophenol	< 20.0	20.0
bis(2-Chloroethyl)ether	< 20.0	20.0
1,3-Dichlorobenzene	< 20.0	20.0
1,4-Dichlorobenzene	< 20.0	20.0
1,2-Dichlorobenzene	< 20.0	20.0
2-Methylphenol	< 20.0	20.0
bis(2-Chloroisopropyl)ether	< 20.0	20.0
4-Methylphenol	< 20.0	20.0
Hexachloroethane	< 20.0	20.0
N-Nitroso-di-n-propylamine	< 100	100
Nitrobenzene	< 20.0	20.0
Isophorone	< 20.0	20.0
2-Nitrophenol	< 20.0	20.0
2,4-Dimethylphenol	< 20.0	20.0
bis(2-Chloroethoxy)methane	< 20.0	20.0
2,4-Dichlorophenol	< 20.0	20.0
1,2,4-Trichlorobenzene	< 20.0	20.0
Naphthalene	< 20.0	20.0
4-Chloroanaline	< 20.0	20.0
Hexachlorobutadiene	< 20.0	20.0
4-Chloro-3-methylphenol	< 20.0	20.0
2-Methylnaphthalene	< 20.0	20.0
Hexachlorocyclopentadiene	< 20.0	20.0
2,4,5-Trichlorophenol	< 20.0	20.0
2,4,6-Trichlorophenol	< 20.0	20.0
2-Chloronaphthalene	< 20.0	20.0
2-Nitroanaline	< 20.0	20.0
Acenaphthylene	< 20.0	20.0
Dimethyl phthalate	< 20.0	20.0
2,6-Dinitrotoluene	< 20.0	20.0
3-Nitroanaline	< 20.0	20.0
Acenaphthene	< 20.0	20.0
2,4-Dinitrophenol	< 100	100
4-Nitrophenol	< 20.0	20.0
Dibenzofuran	< 20.0	20.0
2,4-Dinitrotoluene	< 20.0	20.0
	mg/Kg	mg/Kg

CDF001718

G E O Analytical, Inc.

GEO Job# 9704102(H)-2000
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COMPOUNDS	RESULTS	REPORTING LIMIT
Diethyl phthalate	< 20.0	20.0
Fluorene	< 20.0	20.0
4-Chlorophenylphenyl ether	< 20.0	20.0
4-Nitroanaline	< 20.0	20.0
2-Methyl-4,6-dinitrophenol	< 100	100
N-Nitrosodiphenylamine	< 20.0	20.0
4-Bromphenylphenyl ether	< 20.0	20.0
Hexachlorobenzene	< 20.0	20.0
Pentachlorophenol	< 20.0	20.0
Phenanthrene	< 20.0	20.0
Anthracene	< 20.0	20.0
Carbazole	< 20.0	20.0
Di-n-butyl phthalate	< 20.0	20.0
Fluoranthene	< 20.0	20.0
Pyrene	< 20.0	20.0
Butyl benzyl phthalate	< 20.0	20.0
Benzo(a)anthracene	< 20.0	20.0
3,3'-Dichlorobenzidine	< 100	100
Chrysene	< 20.0	20.0
bis(2-Ethylhexyl) phthalate	< 20.0	20.0
Di-n-octyl phthalate	< 20.0	20.0
Benzo(b)fluoranthene	< 20.0	20.0
Benzo(k)fluoranthene	< 20.0	20.0
Benzo(a)pyrene	< 20.0	20.0
Indeno(1,2,3-cd)pyrene	< 20.0	20.0
Dibenzo(a,h)anthracene	< 20.0	20.0
Benzo(ghi)perylene	< 20.0	20.0
	mg/Kg	mg/Kg

COMPOUND	% SURROGATE RECOVERY	ACCEPTABLE RANGE
2-Fluorophenol	86	33 - 144
Phenol d5	75	62 - 120
Nitrobenzene d5	84	80 - 132
2-Fluorobiphenyl	98	67 - 105
2,4,6-Tribromophenol	88	24 - 135
Terphenyl d14	89	49 - 141

* Indicates surrogate recovery outside of acceptable range.

Analytical Methodology Information

EPA Method SW846-8270B, "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods"

Initial Calibration Date: 04/17/97-05/01/97
Continuing Calibration Date: 04/30-05/03/97
Analyst: T. Lang.

REVIEWED AND APPROVED BY Christy Traxler

CDF001719

G E O Analytical Inc.

Report Issued To: Parsons Engineering Science
19101 Villaview Road, Suite 300
Cleveland, Ohio 44119

GEO Job#: 9704102(I)-2001
Matrix Type: Soil
Samples Received: 04/22/97
Date Analyzed: 04/30-05/05/97
Analysis Reported: 05/06/97

Project Number: 731397.01000
Project Name: Canton Drop Forge

Sample Date: 04/18/97
Sample Description: CDF-7

GAS CHROMATOGRAPHY/MASS SPECTROMETRY FOR SEMI-VOLATILE ORGANICS IN SOIL

COMPOUNDS	RESULTS	REPORTING LIMIT
N-Nitrosodimethylamine	< 100	100
Phenol	< 20.0	20.0
2-Chlorophenol	< 20.0	20.0
bis(2-Chloroethyl)ether	< 20.0	20.0
1,3-Dichlorobenzene	< 20.0	20.0
1,4-Dichlorobenzene	< 20.0	20.0
1,2-Dichlorobenzene	< 20.0	20.0
2-Methylphenol	< 20.0	20.0
bis(2-Chloroisopropyl)ether	< 20.0	20.0
4-Methylphenol	< 20.0	20.0
Hexachloroethane	< 20.0	20.0
N-Nitroso-di-n-propylamine	< 100	100
Nitrobenzene	< 20.0	20.0
Isophorone	< 20.0	20.0
2-Nitrophenol	< 20.0	20.0
2,4-Dimethylphenol	< 20.0	20.0
bis(2-Chloroethoxy)methane	< 20.0	20.0
2,4-Dichlorophenol	< 20.0	20.0
1,2,4-Trichlorobenzene	< 20.0	20.0
Naphthalene	< 20.0	20.0
4-Chloroaniline	< 20.0	20.0
Hexachlorobutadiene	< 20.0	20.0
4-Chloro-3-methylphenol	< 20.0	20.0
2-Methylnaphthalene	< 20.0	20.0
Hexachlorocyclopentadiene	< 20.0	20.0
2,4,5-Trichlorophenol	< 20.0	20.0
2,4,6-Trichlorophenol	< 20.0	20.0
2-Chloronaphthalene	< 20.0	20.0
2-Nitroaniline	< 20.0	20.0
Acenaphthylene	< 20.0	20.0
Dimethyl phthalate	< 20.0	20.0
2,6-Dinitrotoluene	< 20.0	20.0
3-Nitroaniline	< 20.0	20.0
Acenaphthene	< 20.0	20.0
2,4-Dinitrophenol	< 100	100
4-Nitrophenol	< 20.0	20.0
Dibenzofuran	< 20.0	20.0
2,4-Dinitrotoluene	< 20.0	20.0
	mg/Kg	mg/Kg

CDF001720

GEO Analytical, Inc.

GEO Job# 9704102(I)-2001
Page 2 of 2

COMPOUNDS	RESULTS	REPORTING LIMIT
Diethyl phthalate	< 20.0	20.0
Fluorene	< 20.0	20.0
4-Chlorophenylphenyl ether	< 20.0	20.0
4-Nitroanaline	< 20.0	20.0
2-Methyl-4,6-dinitrophenol	< 100	100
N-Nitrosodiphenylamine	< 20.0	20.0
4-Bromophenylphenyl ether	< 20.0	20.0
Hexachlorobenzene	< 20.0	20.0
Pentachlorophenol	< 20.0	20.0
Phenanthrene	< 20.0	20.0
Anthracene	< 20.0	20.0
Carbazole	< 20.0	20.0
Di-n-butyl phthalate	< 20.0	20.0
Fluoranthene	< 20.0	20.0
Pyrene	25.2	20.0
Butyl benzyl phthalate	< 20.0	20.0
Benzo(a)anthracene	< 20.0	20.0
3,3'-Dichlorobenzidine	< 100	100
Chrysene	22.5	20.0
bis(2-Ethylhexyl) phthalate	< 20.0	20.0
Di-n-octyl phthalate	< 20.0	20.0
Benzo(b)fluoranthene	< 20.0	20.0
Benzo(k)fluoranthene	< 20.0	20.0
Benzo(a)pyrene	< 20.0	20.0
Indeno(1,2,3-cd)pyrene	< 20.0	20.0
Dibenzo(a,h)anthracene	< 20.0	20.0
Benzo(ghi)perylene	< 20.0	20.0
	mg/Kg	mg/Kg

COMPOUND	% SURROGATE RECOVERY	ACCEPTABLE RANGE
2-Fluorophenol	92	33 - 144
Phenol d5	64	62 - 120
Nitrobenzene d5	75*	80 - 132
2-Fluorobiphenyl	74	67 - 105
2,4,6-Tribromophenol	87	24 - 135
Terphenyl d14	100	49 - 141

* Indicates surrogate recovery outside of acceptable range.
***Analytical results for this sample are estimated concentration due to low surrogate recovery.

Analytical Methodology Information

EPA Method SW846-8270B, "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods"

Initial Calibration Date: 04/17/97-05/01/97
Continuing Calibration Date: 04/30-05/05/97
Analyst: T. Lang

REVIEWED AND APPROVED BY Christie Thomm

CDF001721

G E O . A n a l y t i c a l , I n c .

Report Issued To: Parsons Engineering Science
19101 Villaview Road, Suite 300
Cleveland, Ohio 44119

GEO Job# 9704102(J)-2002
Matrix Type: Soil
Samples Received: 04/22/97
Date Analyzed: 05/02-05/97
Analysis Reported: 05/06/97

Project Number: 731397.01000
Project Name: Canton Drop Forge

Sample Date: 04/18/97
Sample Description: CDF-8

GAS CHROMATOGRAPHY/MASS SPECTROMETRY FOR SEMI-VOLATILE ORGANICS IN SOIL

COMPOUNDS	RESULTS	REPORTING LIMIT
N-Nitrosodimethylamine	< 100	100
Phenol	< 20.0	20.0
2-Chlorophenol	< 20.0	20.0
bis(2-Chloroethyl)ether	< 20.0	20.0
1,3-Dichlorobenzene	< 20.0	20.0
1,4-Dichlorobenzene	< 20.0	20.0
1,2-Dichlorobenzene	< 20.0	20.0
2-Methylphenol	< 20.0	20.0
bis(2-Chloroisopropyl)ether	< 20.0	20.0
4-Methylphenol	< 20.0	20.0
Hexachloroethane	< 20.0	20.0
N-Nitroso-di-n-propylamine	< 20.0	20.0
Nitrobenzene	< 100	100
Isophorone	< 20.0	20.0
2-Nitrophenol	< 20.0	20.0
2,4-Dimethylphenol	< 20.0	20.0
bis(2-Chloroethoxy)methane	< 20.0	20.0
2,4-Dichlorophenol	< 20.0	20.0
1,2,4-Trichlorobenzene	< 20.0	20.0
Naphthalene	< 20.0	20.0
4-Chloroanaline	< 20.0	20.0
Hexachlorobutadiene	< 20.0	20.0
4-Chloro-3-methylphenol	< 20.0	20.0
2-Methylnaphthalene	< 20.0	20.0
Hexachlorocyclopentadiene	< 20.0	20.0
2,4,5-Trichlorophenol	< 20.0	20.0
2,4,6-Trichlorophenol	< 20.0	20.0
2-Chloronaphthalene	< 20.0	20.0
2-Nitroanaline	< 20.0	20.0
Acenaphthylene	< 20.0	20.0
Dimethyl phthalate	< 20.0	20.0
2,6-Dinitrotoluene	< 20.0	20.0
3-Nitroanaline	< 20.0	20.0
Acenaphthene	< 20.0	20.0
2,4-Dinitrophenol	< 100	100
4-Nitrophenol	< 20.0	20.0
Dibenzofuran	< 20.0	20.0
2,4-Dinitrotoluene	< 20.0	20.0
	mg/Kg	mg/Kg

CDF001722

G E O . A n a l y t i c a l , I n c .

GEO Job# 9704102(J)-2002
Page 2 of 2

COMPOUNDS	RESULTS	REPORTING LIMIT
Diethyl phthalate	< 20.0	20.0
Fluorene	< 20.0	20.0
4-Chlorophenylphenyl ether	< 20.0	20.0
4-Nitroaniline	< 20.0	20.0
2-Methyl-4,6-dinitrophenol	< 100	100
N-Nitrosodiphenylamine	< 20.0	20.0
4-Bromphenylphenyl ether	< 20.0	20.0
Hexachlorobenzene	< 20.0	20.0
Pentachlorophenol	< 20.0	20.0
Phenanthrene	< 20.0	20.0
Anthracene	< 20.0	20.0
Carbazole	< 20.0	20.0
Di-n-butyl phthalate	< 20.0	20.0
Fluoranthene	< 20.0	20.0
Pyrene	20.5	20.0
Butyl benzyl phthalate	< 20.0	20.0
Benzo(a)anthracene	< 20.0	20.0
3,3'-Dichlorobenzidine	< 100	100
Chrysene	25.8	20.0
bis(2-Ethylhexyl) phthalate	< 20.0	20.0
Di-n-octyl phthalate	< 20.0	20.0
Benzo(b)fluoranthene	< 20.0	20.0
Benzo(k)fluoranthene	< 20.0	20.0
Benzo(a)pyrene	< 20.0	20.0
Indeno(1,2,3-cd)pyrene	< 20.0	20.0
Dibenzo(a,h)anthracene	< 20.0	20.0
Benzo(ghi)perylene	< 20.0	20.0
	mg/Kg	mg/Kg

COMPOUND	% SURROGATE RECOVERY	ACCEPTABLE RANGE
2-Fluorophenol	75	33 - 144
Phenol d5	59*	62 - 120
Nitrobenzene d5	72*	80 - 132
2-Fluorobiphenyl	102	67 - 105
2,4,6-Tribromophenol	85	24 - 135
Terphenyl d14	92	49 - 141

* Indicates surrogate recovery outside of acceptable range.
***Analytical results for this sample are estimated concentration due to low surrogate recovery.

Analytical Methodology Information

EPA Method SW846-8270B, "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods"

Initial Calibration Date: 05/01/97
Continuing Calibration Date: 05/02-05/97
Analyst: T. Lang

REVIEWED AND APPROVED BY: Christa Thaxton

CDF001723

G E O Analytical, Inc.

Report Issued To: Parsons Engineering Science
19101 Villaview Road, Suite 300
Cleveland, Ohio 44119

GEO Job#	9704102(K)-2003	Project Number:	731397.01000
Matrix Type:	Soil		
Samples Received:	04/22/97	Project Name:	Canton Drop Forge
Date Analyzed:	05/02-05/97		
Analysis Reported:	05/06/97		

Sample Date: 04/18/97
Sample Description: CDF-9

GAS CHROMATOGRAPHY/MASS SPECTROMETRY FOR SEMI-VOLATILE ORGANICS IN SOIL

COMPOUNDS	RESULTS	REPORTING LIMIT
N-Nitrosodimethylamine	< 100	100
Phenol	< 20.0	20.0
2-Chlorophenol	< 20.0	20.0
bis(2-Chloroethyl)ether	< 20.0	20.0
1,3-Dichlorobenzene	< 20.0	20.0
1,4-Dichlorobenzene	< 20.0	20.0
1,2-Dichlorobenzene	< 20.0	20.0
2-Methylphenol	< 20.0	20.0
bis(2-Chloroisopropyl)ether	< 20.0	20.0
4-Methylphenol	< 20.0	20.0
Hexachloroethane	< 20.0	20.0
N-Nitroso-di-n-propylamine	< 100	100
Nitrobenzene	< 20.0	20.0
Isophorone	< 20.0	20.0
2-Nitrophenol	< 20.0	20.0
2,4-Dimethylphenol	< 20.0	20.0
bis(2-Chloroethoxy)methane	< 20.0	20.0
2,4-Dichlorophenol	< 20.0	20.0
1,2,4-Trichlorobenzene	< 20.0	20.0
Naphthalene	< 20.0	20.0
4-Chloroaniline	< 20.0	20.0
Hexachlorobutadiene	< 20.0	20.0
4-Chloro-3-methylphenol	< 20.0	20.0
2-Methylnaphthalene	< 20.0	20.0
Hexachlorocyclopentadiene	< 20.0	20.0
2,4,5-Trichlorophenol	< 20.0	20.0
2,4,6-Trichlorophenol	< 20.0	20.0
2-Chloronaphthalene	< 20.0	20.0
2-Nitroaniline	< 20.0	20.0
Acenaphthylene	< 20.0	20.0
Dimethyl phthalate	< 20.0	20.0
2,6-Dinitrotoluene	< 20.0	20.0
3-Nitroaniline	< 20.0	20.0
Acenaphthene	< 20.0	20.0
2,4-Dinitrophenol	< 100	100
4-Nitrophenol	< 20.0	20.0
Dibenzofuran	< 20.0	20.0
2,4-Dinitrotoluene	< 20.0	20.0
	mg/Kg	mg/Kg

CDF001724

GEO Analytical, Inc.

GEO Job#: 9704102(K)-2003
Page 2 of 2

COMPOUNDS	RESULTS	REPORTING LIMIT
Diethyl phthalate	< 20.0	20.0
Fluorene	< 20.0	20.0
4-Chlorophenylphenyl ether	< 20.0	20.0
4-Nitroaniline	< 20.0	20.0
2-Methyl-4,6-dinitrophenol	< 100	100
N-Nitrosodiphenylamine	< 20.0	20.0
4-Bromphenylphenyl ether	< 20.0	20.0
Hexachlorobenzene	< 20.0	20.0
Pentachlorophenol	< 20.0	20.0
Phenanthrene	< 20.0	20.0
Anthracene	< 20.0	20.0
Carbazole	< 20.0	20.0
Di-n-butyl phthalate	< 20.0	20.0
Fluoranthene	< 20.0	20.0
Pyrene	22.5	20.0
Butyl benzyl phthalate	< 20.0	20.0
Benzo(a)anthracene	< 20.0	20.0
3,3'-Dichlorobenzidine	< 100	100
Chrysene	22.1	20.0
bis(2-Ethylhexyl) phthalate	< 20.0	20.0
Di-n-octyl phthalate	< 20.0	20.0
Benzo(b)fluoranthene	< 20.0	20.0
Benzo(k)fluoranthene	< 20.0	20.0
Benzo(a)pyrene	< 20.0	20.0
Indeno(1,2,3-cd)pyrene	< 20.0	20.0
Dibenzo(a,h)anthracene	< 20.0	20.0
Benzo(ghi)perylene	< 20.0	20.0
	mg/Kg	mg/Kg

COMPOUND	% SURROGATE RECOVERY	ACCEPTABLE RANGE
2-Fluorophenol	80	33 - 144
Phenol d5	60*	62 - 120
Nitrobenzene d5	78*	80 - 132
2-Fluorobiphenyl	92	67 - 105
2,4,6-Tribromophenol	71	24 - 135
Terphenyl d14	94	49 - 141

* Indicates surrogate recovery outside of acceptable range.
***Analytical results for this sample are estimated concentration due to low surrogate recovery.

Analytical Methodology Information

EPA Method SW846-8270B, "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods"

Initial Calibration Date: 05/01/97
Continuing Calibration Date: 05/02-05/97
Analyst: T. Lang

REVIEWED AND APPROVED BY: Christie Thoxton

CDF001725

GEO Analytical, Inc.

Report Issued To: Parsons Engineering Science
19101 Villaview Road, Suite 300
Cleveland, Ohio 44119

GEO Job#: 9704102(L)-2004
Matrix Type: Soil
Samples Received: 04/22/97
Date Analyzed: 05/02/97
Analysis Reported: 05/06/97

Project Number: 731397.01000
Project Name: Canton Drop Forge

Sample Date: 04/18/97
Sample Description: CDF-10

GAS CHROMATOGRAPHY/MASS SPECTROMETRY FOR SEMI-VOLATILE ORGANICS IN SOIL

COMPOUNDS	RESULTS	REPORTING LIMIT
N-Nitrosodimethylamine	< 100	100
Phenol	< 20.0	20.0
2-Chlorophenol	< 20.0	20.0
bis(2-Chloroethyl)ether	< 20.0	20.0
1,3-Dichlorobenzene	< 20.0	20.0
1,4-Dichlorobenzene	< 20.0	20.0
1,2-Dichlorobenzene	< 20.0	20.0
2-Methylphenol	< 20.0	20.0
bis(2-Chloroisopropyl)ether	< 20.0	20.0
4-Methylphenol	< 20.0	20.0
Hexachloroethane	< 20.0	20.0
N-Nitroso-di-n-propylamine	< 100	100
Nitrobenzene	< 20.0	20.0
Isophorone	< 20.0	20.0
2-Nitrophenol	< 20.0	20.0
2,4-Dimethylphenol	< 20.0	20.0
bis(2-Chloroethoxy)methane	< 20.0	20.0
2,4-Dichlorophenol	< 20.0	20.0
1,2,4-Trichlorobenzene	< 20.0	20.0
Naphthalene	< 20.0	20.0
4-Chloroanaline	< 20.0	20.0
Hexachlorobutadiene	< 20.0	20.0
4-Chloro-3-methylphenol	< 20.0	20.0
2-Methylnaphthalene	< 20.0	20.0
Hexachlorocyclopentadiene	< 20.0	20.0
2,4,5-Trichlorophenol	< 20.0	20.0
2,4,6-Trichlorophenol	< 20.0	20.0
2-Chloronaphthalene	< 20.0	20.0
2-Nitroanaline	< 20.0	20.0
Acenaphthylene	< 20.0	20.0
Dimethyl phthalate	< 20.0	20.0
2,6-Dinitrotoluene	< 20.0	20.0
3-Nitroanaline	< 20.0	20.0
Acenaphthene	< 20.0	20.0
2,4-Dinitrophenol	< 100	100
4-Nitrophenol	< 20.0	20.0
Dibenzofuran	< 20.0	20.0
2,4-Dinitrotoluene	< 20.0	20.0
	mg/Kg	mg/Kg

CDF001726

G E O A n a l y t i c a l , I n c .

GEO Job# 9704102(L)-2004
Page 2 of 2

COMPOUNDS	RESULTS	REPORTING LIMIT
Diethyl phthalate	< 20.0	20.0
Fluorene	< 20.0	20.0
4-Chlorophenylphenyl ether	< 20.0	20.0
4-Nitroanaline	< 20.0	20.0
2-Methyl-4,6-dinitrophenol	< 100	100
N-Nitrosodiphenylamine	< 20.0	20.0
4-Bromphenylphenyl ether	< 20.0	20.0
Hexachlorobenzene	< 20.0	20.0
Pentachlorophenol	< 20.0	20.0
Phenanthrene	< 20.0	20.0
Anthracene	< 20.0	20.0
Carbazole	< 20.0	20.0
Di-n-butyl phthalate	< 20.0	20.0
Fluoranthene	< 20.0	20.0
Pyrene	< 20.0	20.0
Butyl benzyl phthalate	< 20.0	20.0
Benzo(a)anthracene	< 20.0	20.0
3,3'-Dichlorobenzidine	< 100	100
Chrysene	< 20.0	20.0
bis(2-Ethylhexyl) phthalate	< 20.0	20.0
Di-n-octyl phthalate	< 20.0	20.0
Benzo(b)fluoranthene	< 20.0	20.0
Benzo(k)fluoranthene	< 20.0	20.0
Benzo(a)pyrene	< 20.0	20.0
Indeno(1,2,3-cd)pyrene	< 20.0	20.0
Dibenzo(a,h)anthracene	< 20.0	20.0
Benzo(ghi)perylene	< 20.0	20.0
	mg/Kg	mg/Kg

COMPOUND	% SURROGATE RECOVERY	ACCEPTABLE RANGE
2-Fluorophenol	88	33 - 144
Phenol d5	76	62 - 120
Nitrobenzene d5	90	80 - 132
2-Fluorobiphenyl	98	67 - 105
2,4,6-Tribromophenol	98	24 - 135
Terphenyl d14	82	49 - 141

* Indicates surrogate recovery outside of acceptable range.

Analytical Methodology Information

EPA Method SW846-8270B, "Test Methods for Evaluating Solid Waste: Physical/Chemical Methods"

Initial Calibration Date: 05/01/97
Continuing Calibration Date: 05/02/97
Analyst: T. Lang

REVIEWED AND APPROVED BY Christie Thomson

CDF001727

G E O . A n a l y t i c a l , I n c .

Report Issued To: Parsons Engineering Science
19101 Villaview Road, Suite 300
Cleveland, Ohio 44119

GEO Job#: 9704102(C)-1995
Matrix Type: Soil
Samples Received: 04/22/97
Date Analyzed: 04/30-05/02/97
Analysis Reported: 05/06/97

Project Number: 731397.01000
Project Name: Canton Drop Forge

Sample Date: 04/18/97
Sample Description: CDF-1

GAS CHROMATOGRAPHY/MASS SPECTROMETRY FOR SEMI-VOLATILE ORGANICS IN SOIL

COMPOUNDS	RESULTS	REPORTING LIMIT
N-Nitrosodimethylamine	< 100	100
Phenol	< 20.0	20.0
2-Chlorophenol	< 20.0	20.0
bis(2-Chloroethyl)ether	< 20.0	20.0
1,3-Dichlorobenzene	< 20.0	20.0
1,4-Dichlorobenzene	< 20.0	20.0
1,2-Dichlorobenzene	< 20.0	20.0
2-Methylphenol	< 20.0	20.0
bis(2-Chloroisopropyl)ether	< 20.0	20.0
4-Methylphenol	< 20.0	20.0
Hexachloroethane	< 20.0	20.0
N-Nitroso-di-n-propylamine	< 100	100
Nitrobenzene	< 20.0	20.0
Isophorone	< 20.0	20.0
2-Nitrophenol	< 20.0	20.0
2,4-Dimethylphenol	< 20.0	20.0
bis(2-Chloroethoxy)methane	< 20.0	20.0
2,4-Dichlorophenol	< 20.0	20.0
1,2,4-Trichlorobenzene	< 20.0	20.0
Naphthalene	< 20.0	20.0
4-Chloroanaline	< 20.0	20.0
Hexachlorobutadiene	< 20.0	20.0
4-Chloro-3-methylphenol	< 20.0	20.0
2-Methylnaphthalene	< 20.0	20.0
Hexachlorocyclopentadiene	< 20.0	20.0
2,4,5-Trichlorophenol	< 20.0	20.0
2,4,6-Trichlorophenol	< 20.0	20.0
2-Chloronaphthalene	< 20.0	20.0
2-Nitroanaline	< 20.0	20.0
Acenaphthylene	< 20.0	20.0
Dimethyl phthalate	< 20.0	20.0
2,6-Dinitrotoluene	< 20.0	20.0
3-Nitroanaline	< 20.0	20.0
Acenaphthene	< 20.0	20.0
2,4-Dinitrophenol	< 100	100
4-Nitrophenol	< 20.0	20.0
Dibenzofuran	< 20.0	20.0
2,4-Dinitrotoluene	< 20.0	20.0
	mg/Kg	mg/Kg

CDF001728

APPENDIX B:

RESULTS OF GEOTECHNICAL ANALYSES AND STABILITY TESTING FROM APPLIED CONSTRUCTION TECHNOLOGIES, INC.

FOR

CANTON DROP FORGE, INC.
CANTON, OHIO

MAY 1997

ENGINEERING • TESTING • INSPECTION
APPLIED CONSTRUCTION TECHNOLOGIES, INC.
210 HAYES DRIVE • SUITE C • CLEVELAND, OHIO 44131 • (216) 459-TEST • FAX (216) 459-8954
478 E. EXCHANGE ST. • SUITE 202 • AKRON, OHIO 44304 • (216) 253-TEST • FAX (216) 253-3462

2(b)

May 12, 1997

Parsons Engineering Science, Inc.
19101 Villaview Road, Suite 301
Cleveland, Ohio 44119

Attention: Mr. Rick Volpi

SUBJECT: LABORATORY TEST RESULTS
OILY CLAYEY GRAVEL AND SAND FROM
CANTON DROP FORGE

ACT PROJECT NO. 9705.08

Enclosed are the laboratory test results which have been completed on the sample of black oily clayey gravel and sand which was submitted to us on April 18, 1997. Reportedly the material is from Canton Drop Forge and the material is to be placed within a clay lined and capped cell for biological treatment.

It is our understanding that in its present condition the material is very difficult to work with and is not expected to be stable enough to construct a compacted clay cap over it. To improve its stability, we mixed various mixtures of lime and fly ash into the oily waste material. The granular nature of the material made it unsuitable for compression testing; therefore, the stability of the oily waste and the various mixtures of lime, fly ash, and waste were determined by conducting California Bearing Ratio tests (ASTM D1883). The test results are summarized below:

CBR - HIGHER THE BETTER

	Compacted Density	CBR
Oily Waste without Lime and Fly Ash	127.8 pcf	2.7
Oily Waste with 2 % Lime and 10% Fly Ash	120.9 pcf	10.4 - BEST
Oily Waste with 6 % Lime and 22.5 % Fly Ash	115.5 pcf	10.0
Oily Waste with 10 % Lime and 35 % Fly Ash	108.4 pcf	9.3

The test results indicate that the stability of the material can be greatly improved with the addition of minor amounts of lime and fly ash. The stability of the mixture did not improve when larger amounts of lime and fly ash were used.

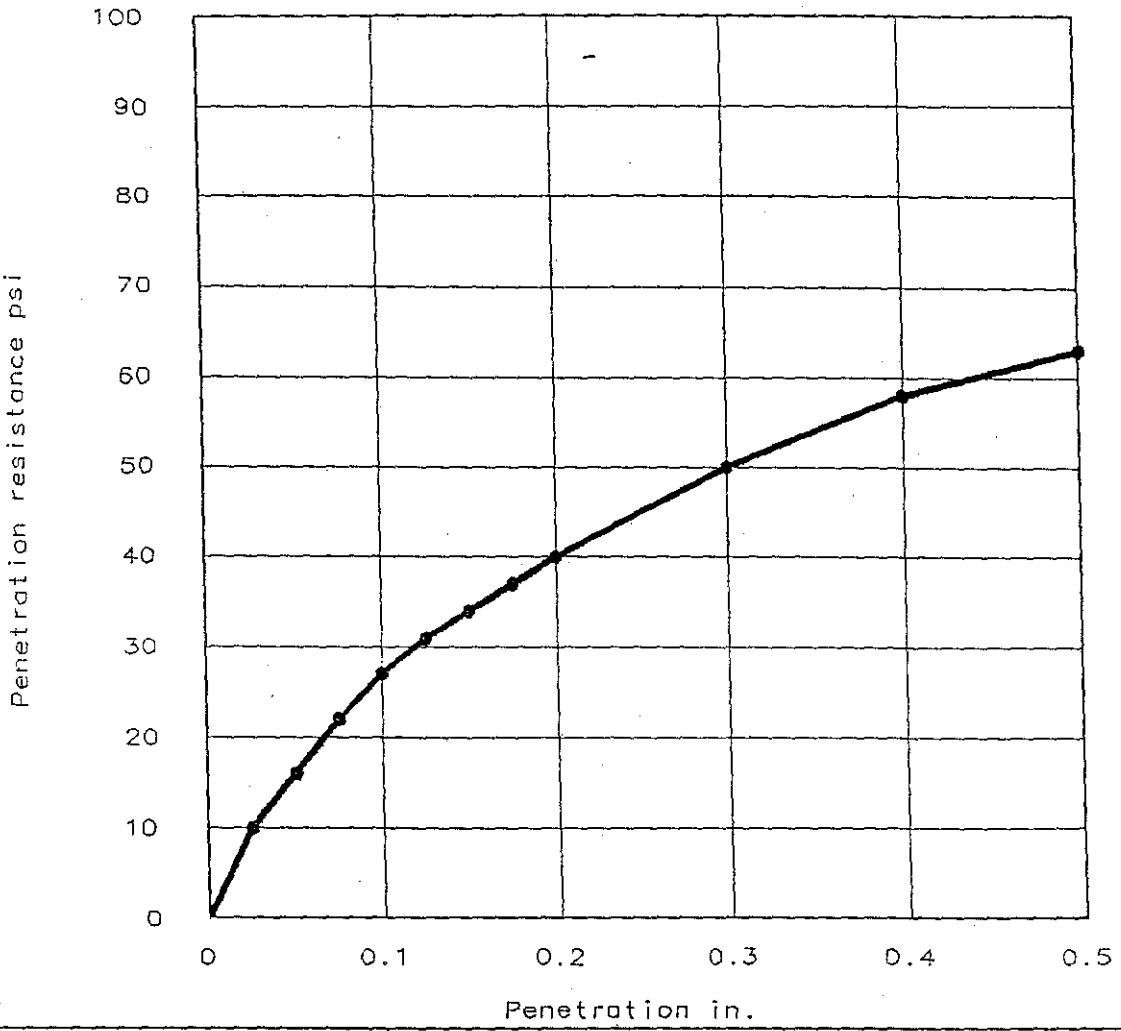
Based on the test results, a properly blended mixture of the oily waste with 2 % lime and 10 % fly ash would be expected to compact readily and be stable under normal construction equipment.

Should you have any questions concerning these test results, please do not hesitate to contact us.

APPLIED CONSTRUCTION TECHNOLOGIES, INC.
by:

Lynton L. Price, P.E.
Director of Engineering

BEARING RATIO TEST REPORT



	Molded			Soaked			CBR (%)		Penet.	Swell
	Dens.	% max	moist	Dens.	% max	moist	0.1"	0.2"	Surcharge	%
1 ●	127.8		3.5%	128.1		4.7%	2.7	2.7	14.93 lbs.	0.0
2 ▲										
3 ■										

MATERIAL DESCRIPTION	USCS	Max. dens.	Opt. w.c.	LL	PI
OILY, CLAYEY GRAVEL & SAND					

Project No: 9705.08
Project: CANTON DROP FORGE
Location: BIOCELL
CLIENT: PARSONS ENGINEERING SCIENCE,INC.
Date: 5/6/97

BEARING RATIO TEST REPORT

APPLIED CONSTRUCTION TECHNOLOGIES, INC.

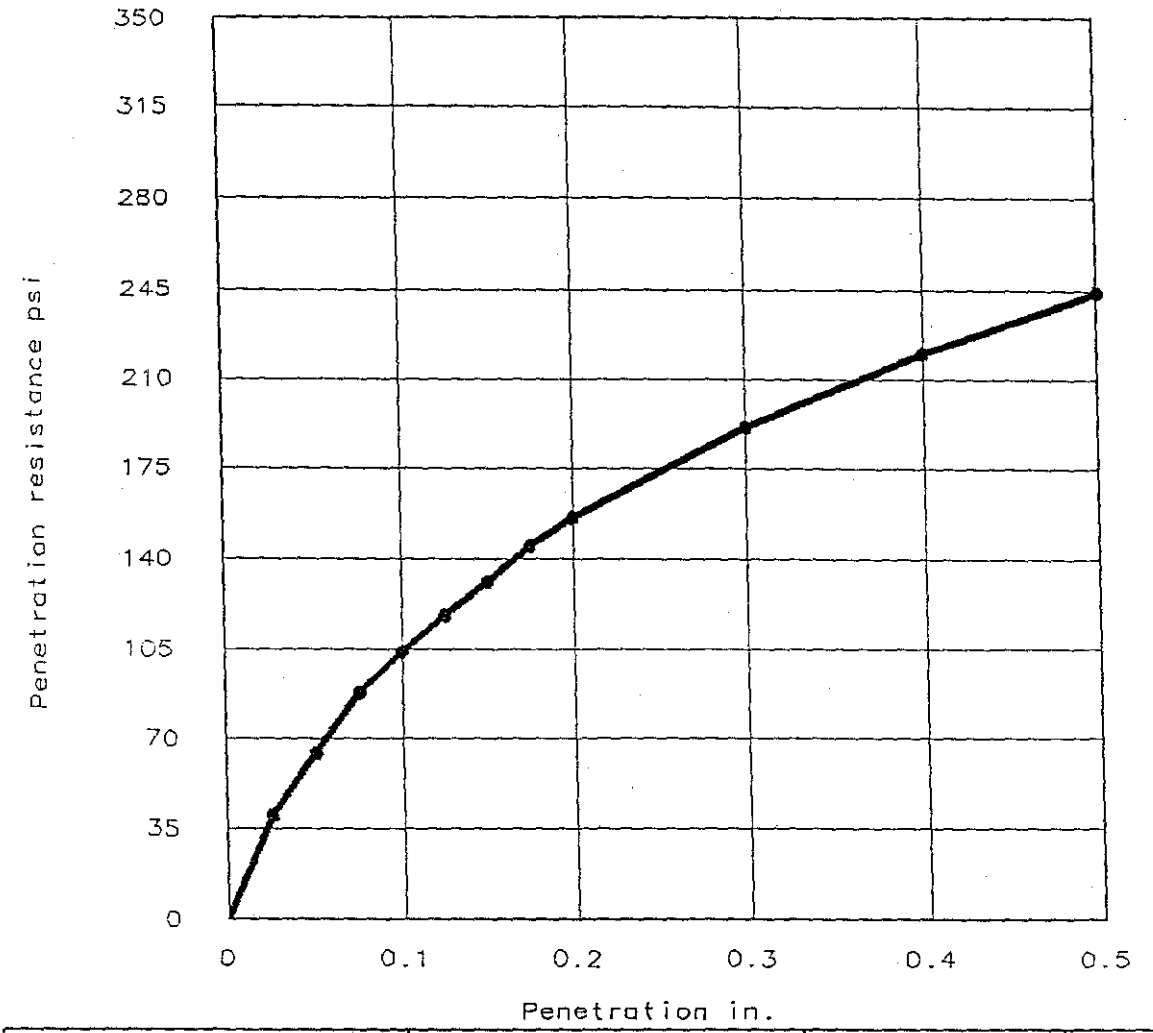
Test Descr./Remarks:

BULK SAMPLE
SUBMITTED TO US BY
PARSONS ENGINEERING
SCIENCE ON 4-18-97

Fig. No.

CDF001732

BEARING RATIO TEST REPORT



	Molded			Soaked			CBR (%)		Penet.	Swell
	Dens.	% max	moist	Dens.	% max	moist	0.1"	0.2"	Surcharge	%
1 ●	120.9		5.4%	120.9		7.6%	10.4	10.4	15.07 lbs.	0.4
2 ▲										
3 ■										

MATERIAL DESCRIPTION	USCS	Max. dens.	Opt. w.c.	LL	PI
OILY,CLAYEY GRAVEL&SAND,WTH 10%FLYASH,2%LIME					

Project No: 9705.08
Project: CANTON DROP FORGE
Location: BIOCELL
CLIENT: PARSONS ENGINEERING SCIENCE,INC.
Date: 5-9-97

BEARING RATIO TEST REPORT

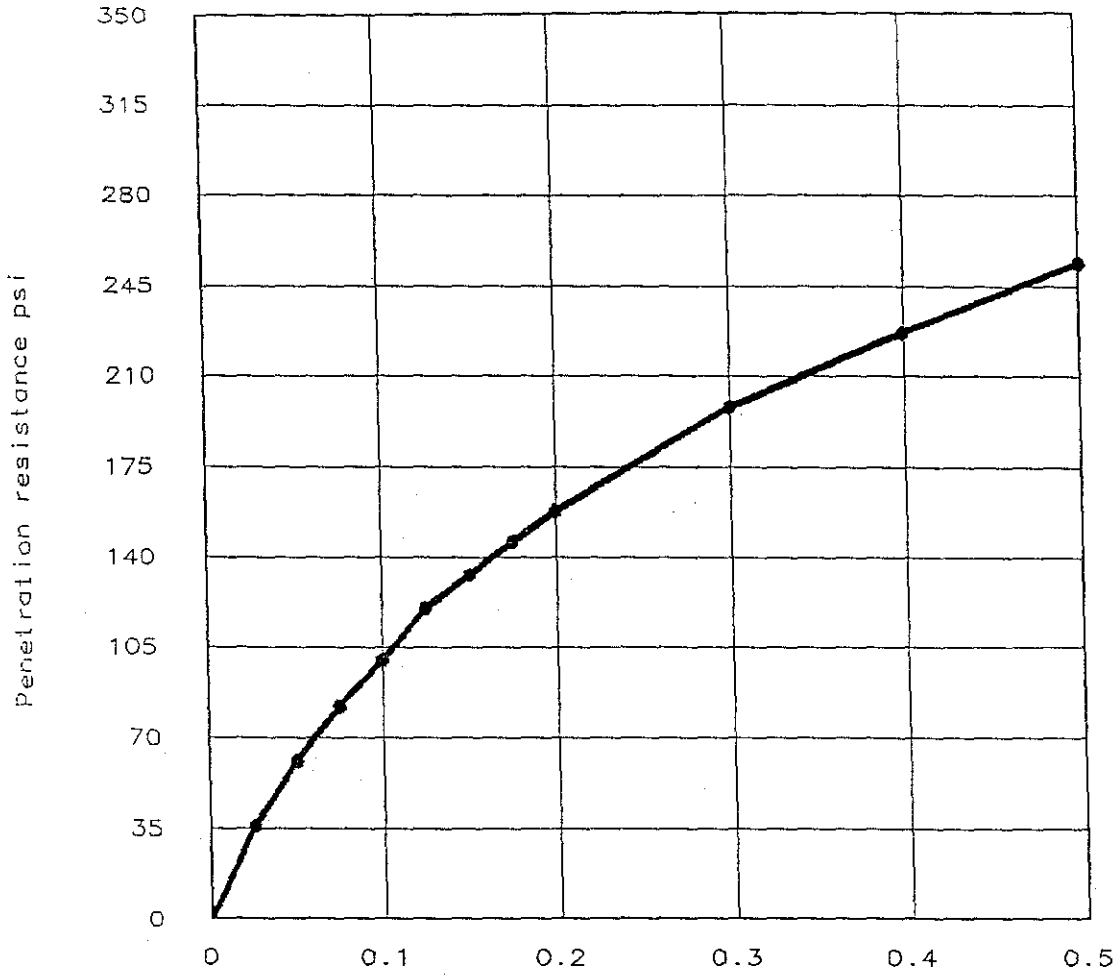
APPLIED CONSTRUCTION TECHNOLOGIES, INC.

Test Descr./Remarks:
ASTM-D 1883

BULK SAMPLE
SUBMITTED TO US BY
PARSONS ENGINEERING
SCIENCE ON 4-18-97

Fig. No.

BEARING RATIO TEST REPORT



	Molded			Soaked			CBR (%)		Penet.	Swell
	Dens.	% max	moist	Dens.	% max	moist	0.1"	0.2"	Surcharge	%
1 ●	115.5		3.2%	114.5		10.1%	10.0	10.5	15.01 lbs.	0.9
2 ▲										
3 ■										

MATERIAL DESCRIPTION	USCS	Max. dens.	Opt. w.c.	LL	PI
OILY,CLAYEY GRAVEL&SAND,WTH22.5%FLYASH6%LIME					

Project No: 9705.08
Project: CANTON DROP FORGE
Location: BIOCELL
CLIENT: PARSONS ENGINEERING SCIENCE,INC.
Date: 5-9-97

BEARING RATIO TEST REPORT

APPLIED CONSTRUCTION TECHNOLOGIES, INC.

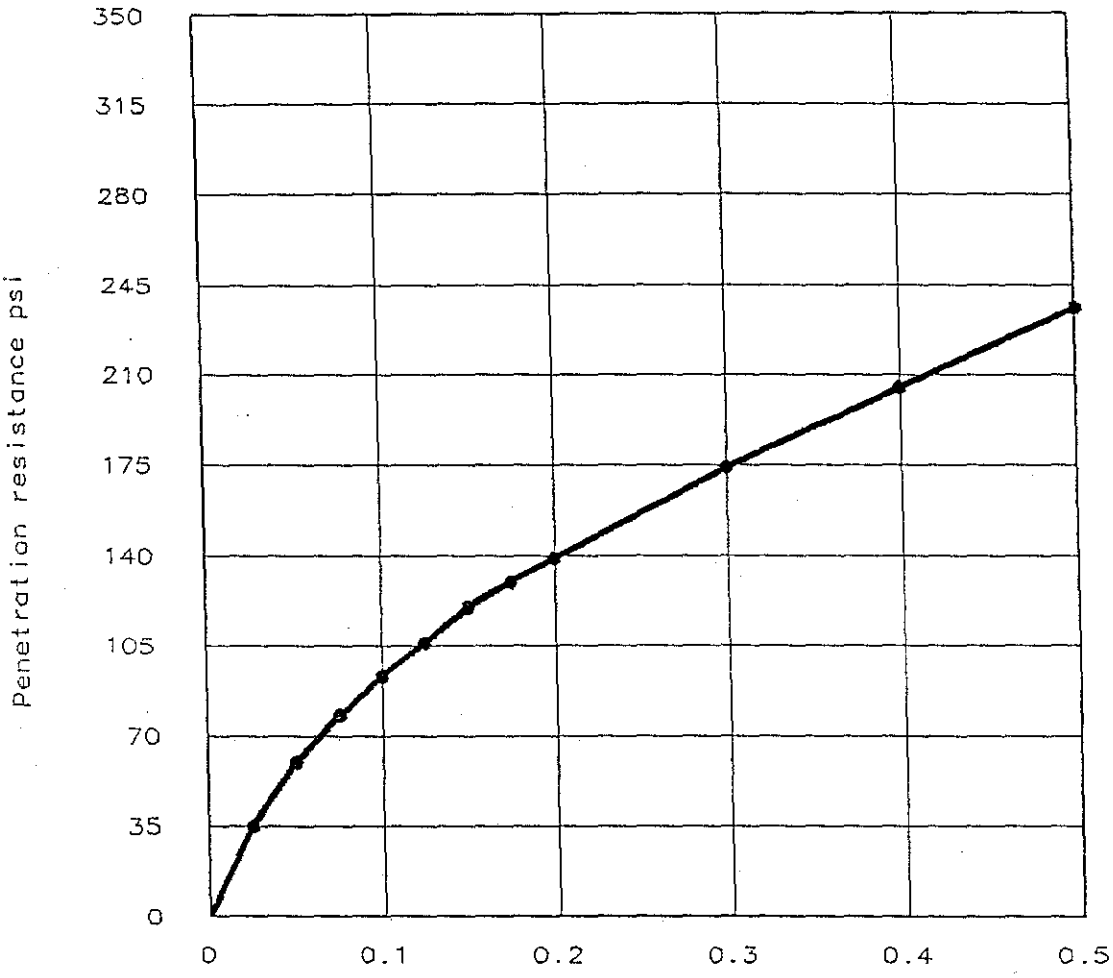
Test Descr./Remarks:
ASTM-D 1883

BULK SAMPLE
SUBMITTED BY PARSONS
ENGINEERING SCIENCE
ON 4-18-97

Fig. No.

CDF001734

BEARING RATIO TEST REPORT



	Molded			Soaked			CBR (%)		Penet.	Swell
	Dens.	% max	moist	Dens.	% max	moist	0.1"	0.2"	Surcharge	%
1 ●	108.4		4.1%	107.5		14.1%	9.3	9.3	15.07 lbs.	0.9
2 ▲										
3 ■										

MATERIAL DESCRIPTION	USCS	Max. dens.	Opt. w.c.	LL	PI
OILY,CLAYEY GRAVEL&SAND WTH 35%FLYASH10%LIME					

Project No: 9705.08
Project: CANTON DROP FORGE
Location: BIOCELL
CLIENT: PARSONS ENGINEERING SCIENCE,INC.
Date: 5-9-97

BEARING RATIO TEST REPORT

APPLIED CONSTRUCTION TECHNOLOGIES, INC.

Test Descr./Remarks:
ASTM-D 1883

BULK SAMPLE
SUBMITTED BY PARSONS
ENGINEERING SCIENCE
ON 4-18-97

Fig. No.

CDF001735

APPENDIX C:

CRITERIA FOR SCREENING ALTERNATIVES FOR CANTON DROP FORGE, INC. LAGOON #1 RE-CONSTRUCTION AND BIOCELL DISPOSAL PROJECT

CRITERIA FOR SCREENING ALTERNATIVES FOR CANTON DROP FORGE, INC. LAGOON #1 RE-CONSTRUCTION AND BIOCELL DISPOSAL PROJECT

Described below are the criteria used for screening the six (6) alternatives considered for the CDF Lagoon #1 re-construction and biocell disposal project and their applications in evaluating these options.

Economic Impact

This criterion considers budget-level unit costs of implementing the six alternatives. These analyses take into account the total costs for addressing the Lagoon #1 re-construction and disposal of biocell material, divided by the estimated volume of the biocell, including the additional material to be removed from Lagoon #1, (i.e., about 5,500 tons). The calculation also takes into account any credits which may be realized for re-use of the biocell material.

Rating structure
1 is > $50 / ton
2 is $35 to $50 / ton
3 is $25 to $35 / ton
4 is $10 to $25 / ton
5 is < $10 / ton

In Option a, costs to test, load, transport, dump (including excise taxes) the biocell material are projected at about $21/ton. Additional expenses are required to reconstruct Lagoon #1, estimated at about $12/ton. (**Note**: This estimate will also be used for Lagoon #1 re-construction in Options b, c, d and e).

In Options d and e, costs to test, screen, fluidize (optional only), load, transport and transfer the material are partial offset by the value the receiving facility placed on it. About $40/ton in total costs (including those for Lagoon #1) are partial offset by credits of about $5/ton for recovered hydrocarbon value in Option d and about $15/ton for displaced raw materials needed in Option e.

Please refer to Table 4 for costs estimated for Option f (about $21/ton).

Schedule Impact

This criterion considers the total time, commencing from CDF's authorization, to complete engineering, procurement, permitting (or other third-party approvals), implementation and closure of the alternatives.

Rating structure
1 is > 8 months
2 is 6 to 8 months
3 is 4 to 6 months
4 is 2 to 4 months
5 is <2 months

CRITERIA FOR SCREENING ALTERNATIVES FOR CANTON DROP FORGE, INC. LAGOON #1 RE-CONSTRUCTION AND BIOCELL DISPOSAL PROJECT

Described below are the criteria used for screening the six (6) alternatives considered for the CDF Lagoon #1 re-construction and biocell disposal project and their applications in evaluating these options.

Economic Impact

This criterion considers budget-level unit costs of implementing the six alternatives. These analyses take into account the total costs for addressing the Lagoon #1 re-construction and disposal of biocell material, divided by the estimated volume of the biocell (i.e., about 4,500 tons). The calculation also takes into account any credits which may be realized for re-use of the biocell material.

Rating structure
1 is > $50 / ton
2 is $33 to $50 / ton
3 is $25 to $35 / ton
4 is $10 to $25 / ton
5 is $10 / ton

In Option a, costs to test, load, transport, dump (including excise taxes) the biocell material are projected at over $40/ton. Additional expenses are required to reconstruct Lagoon #1, estimated at over $15/ton. (**Note**: this estimate will also be used for Lagoon #1 re-construction in Options b, c, d and e), resulting in a total of over $55/ton.

In Options d and e, costs to test, screen, fluidize (optional only), load, transport and transfer the material are partial offset by the value the receiving facility placed on it. About $40/ton in total costs (including those for Lagoon #1) are partial offset by credits of about $5/ton for recovered hydrocarbon value in Option d and about $15/ton for displaced raw materials needed in Option e.

Please refer to Table 4 for costs estimated for Option f (about $33/ton).

Schedule Impact

This criterion considers the total time, commencing from CDF's authorization, to complete engineering, procurement, permitting (or other third-party approvals), implementation and closure of the alternatives.

Rating structure
1 is > 8 / months
2 is 6 to 8 months
3 is 4 to 6 months
4 is 2 to 4 months
5 is <2 months

All by ED
Two Plan Review

It is envisaged that, since Options b, c and f are largely within CDF's control and for Option a significant delays are not anticipated getting landfill approval for disposal of this (previously characterized) non-hazardous material, these actions can be completed within 2 to 4 months. Options d and e are anticipated to require longer periods of time to test, verify quality, get third-party approvals (i.e., from Ashland or asphalt plant) and to fit within their operating schedules. To avoid subsequent re-handling of the material, direct feed to their presses will be required, causing delays in completion.

Technical Feasibility

Technical feasibility takes into account the implementability of the proposed options. The rating is entirely subjective with factors identified regarding the ease or difficulty anticipated.

Rating structure
1 is very difficult to implement
2 is somewhat difficult to implement
3 has neutral difficulty for implementation
4 is reasonably easy to implement
5 is most easily implemented

It is anticipated that Options a, b and f will be reasonably easy to implement. Although there are small risks of failure, these approaches has been completed many times without significant problems. Options c and e have also been attempted before, but the risks of failure (from experience) are higher. For Option c, long-term degradation of the stabilized material may produce undesired results (i.e., leaching and/or structural failure), due to exposure to traffic and the elements. For Option e, difficulty in maintaining stability of the subject material has not been tested and, hence, is uncertain. Option d poses the greatest risks of potential failure, primarily due to the variability in hydrocarbon content, texture, sizing, etc., of the material and the degree of pre-processing which will be required to ensure its satisfactory use in this application. Further consideration of Option d is probably unwarranted.

Stakeholder Acceptance

In this criterion, we attempt to evaluate the acceptability of each option to the myriad of parties which (may) have an interest in this project. The assumed stakeholders are: CDF; regulatory agencies, including Ohio EPA and USEPA; potential customers, including Ashland or the asphalt plant; and neighboring property owners.

Rating structure
1 anticipates potentially insurmountable objectives
2 anticipates some objection
3 is neutral with regards to acceptance
4 is generally acceptable
5 projects complete acceptance

Most of the options (a, b, d and e) are perceived to be neutral with respect to acceptability; there are no known issues or concerns which could prohibit their application. Option c is perceived as potentially less acceptable since the stabilized material will be placed in areas subject to traffic and scrutiny (see also the concern regarding long-term stability). Option f is perceived as the most acceptable in that it permits CDF to address two issues simultaneously (i.e., with one set of actions), does not involve external scrutiny and leaves no biocell material exposed to traffic, the elements or scrutiny.

Permitting Requirements

This assessment addresses the probable need for permits or third-party approvals.

Rating structure
1 anticipates substantial/very difficult requirements
2 anticipates somewhat difficult requirements
3 anticipates moderate requirements
4 anticipates minor requirements
5 anticipates no permitting required

For Options, c and f, no external approvals or permit requirements are anticipated. For Options a, d and e, third-party approvals are required from the receiving facilities.

9/8072

2(b)

PARSONS ENGINEERING SCIENCE, INC.
19101 Villaview Road, Suite 301
Cleveland, Ohio 44119
(216) 486-9005
(216) 486-6119 (facsimile)

FACSIMILE MESSAGE

TO:	Mr. Keith Houseknecht
LOCATION:	CANTON DROP FORGE, INC.
FAX NO.:	(330) 477-2046
FROM:	Ed Karkalik & Gordon Melle
DATE:	22 May 1997
NO. OF PAGES:	3

Dear Keith:

In follow-up to our telephone conversation on Tuesday, 20 May 1997, and in response to your facsimile from yesterday, 21 May 1997, Parsons Engineering Science, Inc. provides the following information:

Q1. Will Canton Drop Forge, Inc. (CDF) be able to remove any material from re-constructed Lagoon #1, say, by vacuum truck, once a clay liner is placed, without damaging the liner?

A1. There should be no problem removing material from Lagoon #1 after the clay liner has been installed, provided that the liner is properly placed and compacted and that removal is not attempted by an intrusive means (i.e., by digging with a shovel).

Q2. Can the fly ash which CDF has on-site from its power plant operation be used in the stabilization of biocell material?

A2. Generally, the answer is "yes", provided that the fly ash has properties similar to that used in the stabilization treatability test. In particular, determination of the absorptive capacity and the chemical composition of the fly ash is important prior to assuming that the fly ash generated on-site can be re-used in the stabilization process. Specifically, the absorptive capacity is required to determine the correct mixture ratio for stabilizing the biocell material. Also, the chemical composition is important to ensure that no additional compounds, which may render the biocell material less stable or less environmentally acceptable, are not being added (i.e., such that leaching may be promoted).

Q3. It is my understanding that any fly ash from the CDF boiler or other will be tested for properties required for the biocell.

9807 2

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Q3. It is my understanding that any fly ash from the CDF boiler or other will be tested for properties required for the biocell.

A3. Although not specifically addressed in our cost estimate, it is not believed that this effort will materially impact the magnitude of the overall estimate (i.e., within the +/- 15% range) for the purposes of comparing the options under consideration. Engineering design activities (not yet authorized or undertaken) will result in a specification for the fly ash. Testing of fly ash, generated from CDF's boiler or any other operations, would be completed subsequently, as part of a yet-to-be defined (or estimated) design and construction review effort.

Q4. Do our estimates include the cost to re-establish the outlet pipe from Lagoon #1 for discharging to Lagoon #2? No

A4. Our estimates have included only those items specifically identified as line items, as in Table 4. As I indicated in our telephone conversation and since the costs for re-establishing the outlet pipe in Lagoon #1 are not materially relevant for comparison between the options, we did not specifically identify, scope or cost this item in our estimates. However, assuming that the existing line is appropriately placed (with respect to elevation) and is appropriately sized (which was not part of our scope and hence, has not been checked), the costs to re-connect the line should not significantly impact our cost estimates.

Q5. It is my understanding that design, material and installation cost for the drain from Lagoon #1 to Lagoon #2 is included in the cost estimates.

A5. As indicated in our telephone conversation and since the costs for designing and installing the drain from Lagoon #1 to Lagoon #2 are not relevant for comparison between the options, any costs required to re-align or otherwise re-establish this line have not been addressed in our estimates. It was assumed that existing lines could be re-used, as necessary. [Subsequent discussions and analysis of the situation suggest that this assumption will not apply. In fact, a new, yet-to-be sized and designed connection from Lagoon #1 to Lagoon #2 will probably be required. The costs to design and install a new line should be identified as part of a subsequent effort. At this time, Parsons ES can only provide a budgetary estimate (i.e., +/- 30%), based on work previously completed by others, of $120,000 for installation of a new, gravity-fed line between the Lagoons.]

Q6. Is cost to remove and dispose of the old pump standpipe in the cost estimates? Will the pump station be required for the future operation of Lagoon #1?

A6. In that the costs for addressing the pump standpipe (either through removal or re-establishment) are not relevant for comparison between the options, these costs are not included in the cost estimates in Table 4. It is uncertain at this time whether removal is appropriate, especially since neither the cost estimate nor the decision to establish a new drain line between Lagoons #1 and #2 has not been made. Should removal and disposal of

the pump standpipe (and appurtenances) become necessary, we estimate that the costs (within +/- 30% range) will be about $3,000.

Q7. It is my understanding that design, material and installation cost for raising the sewer on the West side of the Upset Building is included in the cost estimates.

A7. In that the costs for raising the sewer in question are not relevant for comparison between the options, these costs have not been determined or included in the estimates provided in Table 4.

Q8. During our telephone conversation on Wednesday, 21 May 1997, you indicated a desire to install skimming equipment and storage facilities near Lagoon #1 to recover any oil which may be discharged there.

A8. First, in that CDF had indicated that the objective of re-establishing Lagoon #1 is for storm water control, we had not anticipated any need for this equipment and, hence, had not estimated the costs for providing same.

Also, CDF should be aware that establishment of a permanent oil recovery system at Lagoon #1 may result in a change in the intended use of this impoundment (from storm water control to process water treatment), potentially making a Voluntary Action Program (VAP) approach inappropriate for consideration.

Q9. In the first full paragraph on page 3 of your report, the third line includes the phase "(of three)"; I believe that we had 2 USTs and that one was removed.

A9. As we discussed, based on one of the drawings received from CDF and information provided by Mr. Rick Zollinger, Esq., we understood that there were three UST areas at CDF, one of which was eliminated. Based on our subsequent telephone conversation, we were both correct. There were three UST areas at CDF: one area with a gasoline UST which has since been removed and second which continues to contain a quench oil tank. Both of these tanks are/were regulated under BUSTR. The second UST area as well as a third area also contain several, active heating oil USTs, regulated under Fire Marshal regulations. These operations are important in determining the applicability of VAP rules for use in a prospective closure.

Q10. How will the decision to stop digging out material from Lagoon #1 walls be made?

A10. Assuming that VAP regulatory limits are applied, a geologist trained in this activity will visually observe and identify the point at which the impacted soil has been removed. The same approach will be utilized in removing material for stabilization from the biocell.

98072

PARSONS ENGINEERING SCIENCE, INC.
A UNIT OF PARSONS INFRASTRUCTURE & TECHNOLOGY GROUP INC

19101 Villaview Road, Suite 301 • Cleveland, Ohio 44119 • (216) 486-9005 • Fax (216) 486-6119

PARESCL/597/Dee/EJK7-07

23 May 1997

2(b)

Mr. Keith Houseknecht
CANTON DROP FORGE, INC.
4575 Southway Street
Canton, Ohio 44706

Dear Mr. Houseknecht:

In accordance with our telephone conversations conducted and facsimiles exchanged during the period 19-22 May 1997 and your request to Mr. Gordon Melle late on the afternoon of 22 May 1997, Parsons Engineering Science, Inc. (Parsons ES) is prepared to offer to Canton Drop Forge, Inc. (CDF) the following proposal for incremental services.

PROPOSED SCOPE OF WORK

The tasks comprising Parsons ES' proposed scope of work are as follows:

Task 1 - Hydraulic Analysis and Conceptual Design of Lagoon #1

Parsons ES will review the information received from CDF with respect to the current condition of Lagoon #1's receiving streams and conveyances, discharge system, conveyance to Lagoon #2, and storm water management. Parsons ES will confirm the hydraulic design (completed by others) with respect to: the volume of Lagoon #1 required for storm water management; the size, elevation and alignment of the 8" diameter storm sewer along the West side of CDF's property and the discharge from Lagoon #1; and whether a gravity-fed or pumped system is most appropriate for conveying storm water from Lagoon #1 to Lagoon #2. A conceptual design of the recommended hydraulic system, comprising these elements, will be developed and conveyed to CDF as one (or more, as necessary) CAD drawing(s).

Task 2 - Cost Estimate and Schedule Impacts

Based on the conceptual design generated in Task 1 above, we will develop a budgetary cost estimate, within a range of +/- 15%, for the recommended system. Costs for major system components will be based on at least one quotation from an appropriate vendor or contractor. An estimate of any scheduling impacts, relative to the work previously recommended for stabilization and transfer of the biocell material to Lagoon #1, will also be provided to CDF.

Task 3 - Letter Report Amendment

Parsons ES will amend its letter report, presented to CDF during our meeting on 16 May 1997, as appropriate, to incorporate the information developed in these Tasks.

PROPOSED BUDGET AND SCHEDULE

Parsons ES proposes to complete the Tasks defined above on a lump-sum basis for $1,600. We are aware that the requested work is *urgently* needed by CDF to make informed decisions with respect to the biocell material disposal options previously discussed. Consequently, we will strive to complete this work so that the required information is available for consideration during your Directors' Meeting, scheduled for 29 May 1997.

PROJECT PERSONNEL

The principal technical contributor for the tasks described above will be Ms. Elizabeth (Beth) McCartney; the results of her work will be checked by Mr. Melle.

TERMS AND CONDITIONS

The terms and conditions of Parsons ES' Engineering Services Agreement (ESA) submitted with our proposal dated 11 April 1997, will apply to this work. Your issuance of an Authorization to Proceed (by facsimile is acceptable) will serve as Parsons ES' order to commence activity.

Parsons ES is pleased to have this opportunity to continue to provide services to Canton Drop Forge. If you would like additional information regarding this proposal, please contact either Mr. Melle or Ed Karkalik at (216) 486-9005.

Very truly yours,

PARSONS ENGINEERING SCIENCE, INC.

Wilson H. Rownd, PE
Vice President/Manager

Edward J. Karkalik, PE
Project Manager

WHR/EJK/dee
cc: File 97290097003
Mr. Gordon Melle
Ms. Elizabeth McCartney

PARSONS ENGINEERING SCIENCE, INC.
A UNIT OF PARSONS INFRASTRUCTURE & TECHNOLOGY GROUP INC

19101 Villaview Road, Suite 301 • Cleveland, Ohio 44119 • (216) 486-9005 • Fax (216) 486-6119
PARESCL/597/Dec/EJK7-07

23 May 1997

2(b)

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Post-it® Fax Note 7671	Date 5/23	# of pages ▶ 2
To Keith Houseknecht	From Ed Karkalik	
Co./Dept. CDF	Co. Parsons ES	
Phone #	Phone #	
Fax # (330) 477-2046	Fax #	

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Wilson H. Rownd, PE
Vice President/Manager

Edward J. Karkalik, PE
Project Manager

WHR/EJK/dee
cc: File 97290097003
Mr. Gordon Melle
Ms. Elizabeth McCartney

CANTON DROP FORGE

2(b)

TELECOPIER COVER SHEET

PLEASE DELIVER THE FOLLOWING PAGES TO:

NAME: ED KARKALIK

FIRM: PARSONS E.S.

CITY:

PHONE: ( ) FAX: ( )

FROM:

NAME: KEITH HOUSKNECHT

FIRM: CANTON DROP FORGE

CITY: Canton, OH

TOTAL NUMBER OF PAGES 1 INCLUDING COVER SHEET.

WE ARE TRANSMITTING ON THE FOLLOWING:

DATE: 5/23/97

TIME: 2:30

IF YOU DO NOT RECEIVE ALL PAGES - PLEASE CALL BACK AS SOON AS POSSIBLE.

TELEPHONE: **(330)** 477-4511, EXT. 180

ED

THIS IS AUTHORIZATION TO PROCEED WITH THE WORK AS PROPOSED ON MAY 23, 1997 FOR A LUMP-SUM OF $1,600.

Keith J. Housknecht

CDF001749

4575 Southway Street S.W. • P.O. Box 6902 • Canton, Ohio 44706-0902 • (216) 477-4511 • FAX (216) 477-2046

98072

PARSONS ENGINEERING SCIENCE, INC.

19101 Villaview Road, Suite 301 • Cleveland, Ohio 44119 • (216)486-9005 • Fax:(216)486-6119

DATE: 5-29-97

2(b)

TO: MR KEITH HOUSEKNECHT

LOCATION: CANTON DROP FORGE, INC.

RAPIDFAX NO.: (330) 477-2046

COPIES TO:

FROM: ED KARKALIK

TOTAL NUMBER OF PAGES 3 (including this cover letter)

IF YOU DO NOT RECEIVE ALL THE PAGES, PLEASE CALL BACK AS SOON AS POSS

We are herewith transmitting the following:

DATE	NO.	DESCRIPTION
5/29/97	CDF003	MEMO BY BETH MCCARTNEY REGARDING HY
		ANALYSIS FOR POND / STORM WATER SYST

DEAR KEITH:

PLEASE REFER TO ATTACHED MEMO FOR SUBJEC ANALYSIS.

FOR REASONS DISCUSSED VIA TELEPHONE YESTER 5/28/97, WE ARE CONCENTRATING OUR EFFECTS ON TWO APPROACHES:

(1) A NEW 18" DIAMETER GRAVITY SEWER FROM POND 1 TO POND 2 WITH REPLACEMENT OF A 430 FEET OF THE 8-INCH STORM SEWER ON W SIDE OF UPSETTER BUILDING; VERSUS

(2) A NEW 6-INCH PRESSURE FORCE MAIN BETW POND 1 AND POND 2 WITH APPROPRIATE PUMP ST AND REPLACEMENT OF ABOUT 750 FT OF THE W SIDE STORM DRAIN.

WE WILL FORWARD ADDITIONAL INFO AS SOON AS AVAILABLE.

02000C02

CDF001750

JOB NO. 731397.020

MEMORANDUM

29 May 1997

3(b)

To: Ed Karkalik
Parson ES Cleveland

From: Elizabeth J. McCartney
Parsons ES Cleveland

Subject: Canton Drop Forge
Storm Water Hydrology and Hydraulics Associated with Pond 1 (Lagoon)

I have reviewed the design developed by H&A and have performed additi hydrologic/hydraulic analysis for the Pond 1 system. The results are as follows:

A hydrologic analysis of the runoff to the Pond 1 and Pond 2 drainage areas were perfo using the TR-55 computer model. A 24 hour, type II, 25 year storm was utilized. The peak results agreed with the results calculated by H&A. This runoff information was used to evalu the size of Pond 1 and the discharge piping between Pond 1 and Pond 2.

The volume of runoff from a 24 hour, 25 year storm to Pond 1 is 68,220 cubic feet. Wit discharge and an initially empty pond this would correspond to a water elevation of approxim 1064. If the water level was already at 1057.5 (proposed outlet pipe invert elevation), the w elevation would reach 1066 if the discharge was prevented.

If the 8 inch storm sewer west of the Upsetter Building is replaced with an 8 inch PVC se from Manhole MH-P to Pond 1 (approximately 254 feet) so that the discharge is at in elevation 1059.44 (slope 0.007) this section of piping will have the same capacity as the exi section from MH-M to MH-N. This design will result in submerged conditions in the storm s under some conditions as the elevation of the water in Pond 1 goes above elevation 1059.44. prevent the sewer from operating in submerged conditions, the sewer would need to be repl back to MH-M (430 feet).

Both a gravity and pressure force main between Pond 1 and Pond 2 were evaluated. The requ size of a gravity sewer is dependent on the allowable water level in Pond 1. Pipe sizes from 18 inch were evaluated with the following conclusions:

	18" Sewer	16" Sewer	14" Sewer	12" Sewer	10" Sewer	8" Sewe
Maximum Pond Water Elevation Based on a 24 hour 25 year Storm	1059.9	1060.8	1061.3	1061.5	1062.0	1062

Two alternatives were evaluated for a pressure force main. One alternative included new p
from Pond 1 to Pond 2. A second alternative involved tying into existing piping, both pre
and gravity. The evaluation was based on pumping the 24 hour, 25 year runoff into Pond
Pond 2 over a 24 hour period. This results in a design pump rate of 355 gallons per minute
a pressure line, the minimum pipe size would be 6 inches. The pump TDH would be 33 fee
the pump horsepower would be 7.5 hp. It was proposed that we could tie into an existing
force main approximately 350 feet from Pond 1. The velocity in this force main would be 9.
per second which is above the recommended range. A new 6 inch line could be installed t
gravity portion of the existing sewer, approximately 500 feet away from Pond 1. This w
require a pump with a TDH of 20 feet and a pump horsepower of 5 hp. The capacity o
existing gravity storm sewers could not be evaluated do to inadequate information provided.

EJM